Published every Saturday by the Simmons-Boardman Publishing Company, 1309 Noble Street, Philadelphia, Pa., with editorial and executive offices: 30 Church Street, New York, N. Y., and 105 West Adams Street, Chicago, Ill.

SAMUEL O. DUNN, *Chairman of Board*
HENRY LEE, *President*
LUCIUS B. SHERMAN, *Vice-Pres.*
CECIL R. MILLS, *Vice-Pres.*
ROY V. WRIGHT, *Vice-Pres. and Sec.*
FREDERICK H. THOMPSON, *Vice-Pres.*
GEORGE SLATE, *Vice-Pres.*
ELMER T. HOWSON, *Vice-Pres.*
F. C. KOCH, *Vice-Pres.*
JOHN T. DEMOTT, *Treas.*

CLEVELAND
Terminal Tower

WASHINGTON
832 National Press Building

SAN FRANCISCO
58 Main St.

Editorial Staff
SAMUEL O. DUNN, *Editor*
ROY V. WRIGHT, *Managing Editor*
ELMER T. HOWSON, *Western Editor*
H. F. LANE, *Washington Editor*

B. B. ADAMS
C. B. PECK
W. S. LACHER
ALFRED G. OEHLER
F. W. KRAEGER
E. L. WOODWARD
J. G. LYNE
J. H. DUNN
D. A. STEEL
R. A. DOSTER
H. C. WILCOX
NEAL D. HOWARD
CHARLES LAYNG
GEORGE E. BOYD
WALTER J. TAFT
M. H. DICK

The Railway Age is a member of the Associated Business Papers (A. B. P.) and of the Audit Bureau of Circulations (A. B. C.).

Subscriptions, including 52 regular weekly issues, payable in advance and postage free; United States and possessions, 1 year $6.00, 2 years $10.00; Canada, including duty, 1 year $8.00, 2 years $14.00; foreign countries, 1 year $8.00, 2 years $14.00.

Single copies, 25 cents each.

Railway Age

With which are incorporated the Railway Review, the Railroad Gazette and the Railway Age-Gazette. Name registered U. S. Patent Office.

Vol. 97 August 11, 1934 No. 6

In This Issue

A Two Years' Discussion of Business and Business Problems..Page 164
Excerpts from *Railway Age* editorials from September, 1932, to date, reflecting the beginning of recovery and the checks it has several times experienced because of the adoption of unsound policies by the government.

Convert Old Fixed Spans Into Vertical Lift Spans..... 168
Navigation of Illinois waterway necessitates change which railroads have effected by ingenious alterations of three existing bridges.

Impact Tests of Box Cars by A.R.A..... 177
Cars of three designs subjected to impact at relatively high velocities show ample structural strength—Problem now is to protect the lading.

EDITORIALS

A Year's Failure Of The "Recovery" Policies..... 161
Motor Regulation Needs Votes, Not Arguments..... 163

GENERAL ARTICLES

A Two Years' Discussion of Business and Business Problems..... 164
Convert Old Fixed Spans Into Vertical Lift Spans..... 168
Empty Mileage and Car Pooling..... 172
Freight Car Loading..... 174
Grouping of N. J. and New York Rates Approved..... 175
Impact Tests of Box Cars by A.R.A..... 177
Roosevelt Shows Great Enthusiasm for Waterways..... 180
Indexes to Volume 96..... 181

ODDS AND ENDS..... 181

NEWS..... 182

REVENUES AND EXPENSES OF RAILWAYS..... 188

The Railway Age is indexed by the Industrial Arts Index and also by the Engineering Index Service

Exide

ANNOUNCES AN OUTSTANDING IMPROVEMENT

New Exide Mipor Separator . . The Permanent Storage Battery Plate Insulator

Flexibility and resiliency are among the many desirable characteristics of the New Exide Mipor Separator. It is not affected by high temperatures or severe vibration under adverse operating conditions.

Since the middle of the nineteenth century, scientists and storage battery engineers have been searching for a separator material that acts as a permanent electrical insulator, while permitting a free and uninterrupted diffusion of electrolyte. A material of uniform structure and strength, with the necessary mechanical qualities to withstand severe vibration and rough conditions of service to which a battery is often subjected. A material unaffected by either electrolyte or excessive battery temperatures. Exhaustive tests, in the laboratory and the field, have proved that this long-sought-for material has been found in Exide Mipor.

Exide-Ironclad Batteries for railway air-conditioning, car-lighting and motive power for haulage units are now equipped with this revolutionary new separator — Exide Mipor. It is a development of the most overwhelming significance in storage batteries — the most important since 1910, when the Exide-Ironclad battery was introduced.

"Mipor" (Reg. U. S. Patent Office) is derived from the word "Microporous," descriptive of its almost infinitesimal pores.

A Year's Failure Of The "Recovery" Policies

The American Federation of Labor's monthly survey of business was widely quoted in the press on August 1. Among other things, it emphasized the following: (1) The enormous expenditures being made by the government upon public works and for relief probably will cause resort "to currency inflation to meet the huge deficits accumulating" unless there is soon a general expansion of production and consumption. (2) The gains made in production "are important, but they are not enough to restore business to pre-depression levels nor to put the unemployed to work." The gains made in buying power thus far are due to "the NRA program to reduce hours and raise wages" and to "enormous expenditures of the government for emergency needs," but "there has as yet been no corresponding increase in the creation of wealth sufficient to pay all the costs of the gains." (3) "Clearly, the federal government could not possibly borrow enough to replace the credit normally extended to business through the banks and security markets unless it used the credit to create a proportionate amount of wealth. Funds loaned to the government produce no wealth. . . . The present situation is a challenge to the administration to give us a plan whereby industry, labor and the government may co-operate to restore business."

Before and After the "New Deal"—a Contrast

For more than a year now the government's general economic policy has been predicated upon socialist-union labor theories. The statements made by the American Federation of Labor are a declaration that this general policy has thus far been a failure, a view but too well supported by the facts. It is almost 24 months since, late in August, 1932, there began the first substantial improvement in business since the commencement of the depression. Let us look at the record of these almost two years.

During the eleven months from September 1, 1932, to July 31, 1933, the present revolutionary "recovery" and "reform" policies of the Roosevelt administration were not in effect. General business, as measured by car loadings, improved throughout this period excepting during the banking crisis in the first quarter of 1933. It was stimulated by the closing and opening of the banks with restrictions upon withdrawals of deposits, and the passage of the economy and "beer" bills in March, 1933. Carloadings in December, 1932, were relatively about 12 per cent larger than in July, 1932. They further increased until in July, 1933, they were 30 per cent larger than in July, 1932.

What has occurred since August 1, 1933, under the novel "recovery" policies illustrated by NRA, AAA and the public works program? General business, as measured by car loadings, declined in August, September and October, 1933, increased during the next five months, and declined again during the next four months. The net result was that car loadings in July, 1934, were 5½ per cent less than in July, 1933. To summarize: In the eleven months before the "new deal" got into effective action, the volume of business, as measured by car loadings, declined in three months and increased in eight months, the final outcome being a net gain of 30 per cent. In the twelve months since the "new deal" got into effective action the volume of business has increased in five months and declined in seven months, the final outcome being a net loss of 5½ per cent in car loadings.

Predictions Regarding "New Deal" Fulfilled

It cannot be said that facts showing that business was improving before NRA and other "new deal" policies were adopted, or reasons why they probably would hinder or arrest the improvement, were not presented. The *Railway Age* publishes elsewhere in this issue a series of extracts from editorials which have appeared in these columns within the last two years. They show that as early as in its issue of September 17, 1932, and subsequently, this paper in editorials gave facts demonstrating that revival of business had begun; applauded the measures adopted by Congress in March, 1933; opposed "new deal" measures later proposed because they would arrest the improvement; showed after they were passed that they were arresting it; expressed optimism only because of belief that the natural forces of recovery would prove stronger than the "new deal" policies; and urged throughout the last session of Congress that they be modified especially in the interest of revival of the durable goods industries, without which it was shown that prosperity could not be restored. Similar views have been publicly expressed

during the last year by many economists and leaders of business opinion. They failed adequately to influence President Roosevelt and the radicals advising and supporting him. The recession in business last fall, and the more serious recession within recent months, are the results.

The *Railway Age* does not condemn all the economic policies of the Roosevelt administration. It has endorsed the banking, economy and prohibition legislation enacted in March, 1933. It endorses the National Housing Act, passed at the recent session of Congress, because it provides for the use of government credit to stimulate private investment in home building and modernization and thereby revival of the durable goods industries. Why have other "recovery" measures hindered the improvement of business? The reasons could not be better illustrated than by the way in which they have affected the railways.

The Railways' Contribution to Recovery

In the first six months of 1934 the railways contributed as largely as they could toward a revival of business. They increased their average number of employees from 938,142 to 1,009,425, or by 71,283 or 7.6 per cent, and they increased the compensation paid to their employees by $82,500,000, or 12½ per cent. They increased their purchases of equipment, materials and supplies (exclusive of fuel) from about $110,000,000 to about $300,000,000, or more than 170 per cent. These increases in their employment and purchases, which were made partly with money borrowed from the government, were made in the hope of a continued increase in traffic and net operating income, and were of great importance because of their tendency, like that of the National Housing Act, to help revive the durable goods industries.

What return have the railways received for their contributions toward recovery? Since March the increase of their freight traffic has been less than seasonal, and finally in July it became smaller than last year. This recession of traffic, like that last fall, has been due to increased costs and reduced profits in industry caused by NRA, to failure adequately to increase agricultural purchasing power partly because of increased NRA costs and prices, and partly because of the drouth, and to uncertainties and fears in business caused by government policies in general. Owing to this recession of traffic, to larger expenditures for maintenance, and to increased costs under NRA, the large increase in railway net operating income which occurred in the first four months of the year was turned into a decline in May and June, and in the second quarter of the year, although gross earnings were larger than last year, net operating income was smaller.

Larger gross earnings and smaller net earnings seem to have been the rule in this quarter in most other lines of business. The increased costs caused by NRA were not offset by as large increases in the volume of business as the proponents of the "new deal" promised. The increased industrial prices caused by NRA helped to prevent the increase in agricultural purchasing power promised. Finally came July, with an actual decline of general business and railway traffic, and with industry in general loaded with "new deal" increases of costs and taxes, and the railways in particular confronted with "new deal" advances in prices, wages and pension legislation.

Causes of Improvement and Recession

"The present situation," says the American Federation of Labor, "is a challenge to the administration to give us a plan whereby industry, labor and the government may co-operate to restore business." It is plainly a challenge to present government economic policies and those responsible for them. If we may judge by the experience of the last year, however, the trouble with any plan that may be sponsored by the administration will be that, while the administration and organized labor probably will be able to agree upon it, business will not be able to agree to it. No sound economist or intelligent business man can agree any longer with policies predicated upon the assumption that labor costs in industry should be advanced to increase national purchasing power; that the profits in the industries that must be relied upon to buy from the durable goods industries can be reduced and the durable goods industries at the same time be revived; or that an orgy of government spending and taxing, together with other policies such as those just mentioned, can ever "prime the pump of business."

Wage earners are only a part of the population, and it has become plain that every increase in their wages that is not based upon an increase in the volume of production and commerce simply reduces the purchasing power of the rest of the population. The durable goods industries, directly and indirectly, derive their business from the profits made by other industries, and therefore cannot be revived excepting by increasing the profits of the railroads and other industries that are their customers. The money for huge government spending must be derived from taxes or the sale of bonds, and the more the government raises taxes and sells its bonds, the less current income and capital there is left available for investment and employment in private business.

A. F. of L. Right and Wrong

The American Federation of Labor is right in saying that investment and production must be increased in private business. Otherwise there will be no increase in the national income to provide increased employment and pay the increased taxes necessitated by huge government spending. It is wrong in saying that "the gains in buying power thus far have been due" to the NRA program to reduce hours and raise wages and to government spending. They have hindered, not helped. Such actual increases in business and buying power as have occurred have been due to the natural

forces of recovery which increased production and commerce so much within the eleven months before NRA became effective and the orgy of government spending began that railway car loadings increased 30 per cent. Excepting for the "recovery" measures mentioned by the A. F. of L. and other similar government influences production, commerce and railway loadings might well have been increased another 30 per cent between July, 1933, and July, 1934, instead of declining.

Following the reopening of the banks in March, 1933, business in this country was improving with unprecedented rapidity. All it needed was opportunity, unhampered by artificial government measures, to continue to improve. But a lot of economic and business amateurs in Washington, imbued with socialist-labor theories, and audacious in their inexperience and ignorance, decided, without any mandate from the people, that we must have a "planned economy." The time was "out of joint," and they had been "born to set it right." They have planned and executed so well, especially in the supposed interest of the wage earner, that even the American Federation of Labor now says, after a year of their planning and executing, "Nothing in the business picture at present gives promise of substantial business improvement in the near future."

The Way Out

What is the way out? The *Railway Age* in an editorial published in its issue of March 4, 1933, the day on which Franklin D. Roosevelt was inaugurated President of the United States, expressed the following views: "This paper believes the purely economic problems that must be solved to revive business are plainer and simpler than most persons think. The depression was caused by unsound policies in both government and business which prevailed for some years. . . . It is time to revive the old-fashioned policy of having the government interfere as little as possible with business; of having it restrict the revenues collected from the people to the amount required for the ordinary functions of government; of having government give aid only to the destitute, and not to those who have got into economic trouble through their own mistakes or who seek its help in competing with more efficient business rivals; of leaving business men, farmers and working men to conduct their own affairs and make their own living as best they can. What government should do is, not to try to tell the people what to do and tax them to death to carry out the theories of politicians and bureaucrats, but reduce their taxes and release their brains and energies in order that they may do as well as they can for themselves."

The policies advocated in this editorial were the exact opposite of those actually followed from July, 1933, to July, 1934. Result: Railroad car loadings, the best single measure of the total volume of production and commerce, were 30 per cent larger in July, 1933, than in July, 1932, and 5½ per cent smaller in July, 1934, than in July, 1933. There is certainly nothing in the experience of the last two years, and especially of the last year, which indicates that the "new deal" way of getting out of a depression is an improvement over the ways in which recovery from previous depressions was accomplished. The way out is for business men to manage business the best they can under or in defiance of NRA, and at the same time to oppose and attack constantly and with every weapon available the government policies that are preventing the recovery that so promisingly began two years ago.

Motor Regulation Needs Votes, Not Arguments

> Broadly speaking, the buses are running wild. All the evils of early day railroading—long hours, underpaid workers, lack of inspection and still more complete lack of regulation—mark bus traffic today; and 21 lives in two days paid a part of the price!
>
> How long will America tolerate this sort of thing?
>
> *From an Editorial in "Labor"*

The answer to this question is that the American public will tolerate the conditions which exist just so long as they continue to vote for legislators who let them exist, and withhold their votes from candidates who would willingly correct them. Just what are the unions, for which "Labor" is the mouthpiece, doing to assure the election of legislators who will correct the conditions about which it complains? In endorsing candidates, are they inquiring their views on this question, or are they not rather giving or withholding endorsement solely on the so-called "labor" record of these candidates?

The editors of "Labor" ought to know that fiery rhetoric does not affect political policies. Only votes can do that. As long as politicians know that they can secure the endorsement of the railway labor organizations merely by voting for the union side in matters at dispute with railway managements, what practical incentive are the unions offering to get them to do any more than that? Having thus clinched the endorsement of the railway unions, they might as well go out and garner in the bus, truck and waterway vote also—as some politicians whom the labor organizations endorse have done—by voting against the railways and in favor of their competitors.

This is practical politics, and we believe the editors of "Labor" and the leaders of the standard railway labor organizations are smart enough to know it. When we begin to read in "Labor" lists of candidates approved or opposed by the unions because of their stand on bus and truck and waterway regulation, we shall believe that the organizations really mean business when they say they favor such legislation. Bus, truck and waterway regulation has had water-tight logic presented in its favor for years. It languishes, not for lack of arguments, but for lack of votes.

A Two Years' Discussion

BEGINNING with an editorial published in its issue of September 17, 1932, showing that a change that was then occurring in the trend of freight car loadings plainly indicated that a substantial improvement in general business finally had commenced, the *Railway Age* has been for two years editorially discussing what should and should not be done by government affecting business. Throughout the period of fifteen months since they began to be introduced as bills in Congress, this paper has been opposing and criticising the various alphabetical "recovery" measures of the government upon the ground that they would hinder, and after their adoption actually were hindering, the revival of business.

These "recovery" measures, which were enacted by Congress in June, 1933, have now been in actual effect for more than a year. Have their advocates and defenders, or their opponents and critics, been right? After having declined in August, September and October, 1933, increased during the next five months, and then declined again since March, 1934, the total volume of business done in the country has been less in July, 1934, and thus far in August than it was during the same part of last year.

Recessions Could Have Been Avoided

The *Railway Age* believes these recessions of business during the last year were easily avoidable; that they have been due to the unsound government economic policies that have been followed, and would not have occurred excepting for these policies; and that everything possible should be done to prevent continuance of these policies and cause the substitution of constructive policies.

As a contribution to the discussion of what has been done, what should not have been, what should have been done and what should be done in future, this paper ventures, in the hope that they may be regarded as significant, to publish the following quotations from editorials that have appeared in its columns within the last two years:

September 17, 1932.—"The statistics of freight car loadings for recent weeks, and especially for the week ended September 3, the latest available, indicate that a real improvement in general business has begun."

October 22, 1932.—"The best single measure of the total volume of production and commerce is the amount of freight shipped by railroad. . . . . The normal seasonal increase between June and October in years of prosperity has been about 12½ per cent. The increase . . . . between June and . . . . the first two weeks in October was almost 27 per cent."

October 29, 1932.—"The increase in car loadings between June and October, 1932, which was *seven times* as great as between the same months of 1930 and 1931, is the most conclusive answer that could be given to the question as to whether business at last has begun substantially to improve. This improvement doubtless is partly due to the more or less artificial stimulants applied by the federal government through the federal reserve system, the Reconstruction Finance Corporation and expenditures upon public works, but unquestionably it is mainly due to natural economic developments."

December 17, 1932.—"Emphasis is placed upon the desirability during such periods of maintaining 'purchasing power.' This, of course, raises a question as to whose purchasing power it is proposed to maintain. A depression is always accompanied by declines of prices and business which automatically reduce the incomes and purchasing power of most persons. If . . . . the wages of some are artificially maintained, the result is to create a disparity in economic conditions which further reduces the already reduced purchasing power of those whose incomes have declined."

Business Improvement in Last One-Third of 1932

January 14, 1933.—"No better evidence of the change in the trend of general business that began last summer could be afforded than the facts regarding railway freight traffic and earnings in the first eight months and in the last four months of 1932. In the first eight months of 1932 car loadings were 28 per cent less than in the first eight months of 1931. In the last four months of 1932 they were only 17 per cent less and in December only 9 per cent less . . . . . In the first eight months of the year the total net operating income earned was $152,295,000, or 57 per cent less than in 1931, while in September, October and November it was $147,665,300, or only 5.6 per cent less than in 1931."

February 4, 1933.—"Whether the upward trend of business that prevailed during the last one-third of 1932 will be maintained during 1933 is, of course, conjectural. . . . . Readjustments already made, and increasing confidence and courage among business men and the public generally, explain the improvement that already has occurred, and there seems good reason to hope that the operation of economic forces will overcome the resistance of organized minorities, and that the improvement already begun will continue."

March 4, 1933.—"While not a political newspaper, the *Railway Age* welcomes the advent today of the Democratic party to full control of the policies of the federal government. . . . . This paper believes the purely economic problems that must be solved to revive business are plainer and simpler than most persons think. The depression was caused by unsound policies in both government and business which prevailed for some years. . . . . It is time to revive the old fashioned policy of having the government interfere as little as possible with business; of having it restrict the revenues collected from the people to the amount required for the ordinary functions of government; of having government give aid only to the destitute, and not to those who have got into economic trouble through their own mistakes or who seek its help in competing with more efficient business rivals; of leaving business men, farmers and working men to conduct their own affairs and make their own livings as best they can. What government should do is, not to try to tell the people what to do and tax them to death to carry out the theories of politicians and bureaucrats, but reduce their taxes and release their

Business and Business Problems

How Editorials in the Railway Age from September, 1932, to the Present Time Have Shown the Beginning and Increase of Improvement, Advocated Sound and Opposed Unsound Government Policies, and Anticipated the Hindrance to Recovery That Has Been Caused by the Government Policies Followed During the Last Year

brains and energies in order that they may do as well as they can for themselves."

March 25, 1933.—"The government at Washington has been doing things so fast for three weeks that it may soon be able, comparatively speaking, to ask many business men why they don't do something to help business.

"The government closed the banks to stop the drain upon them, and a large majority of banks have now been reopened under legislation enabling the government to restrict withdrawals which assure their continued solvency. Provision has been made for increases in currency sufficient for all needs, but deposits have increased so much that apparently the additional currency contemplated will be unnecessary. An 'economy' bill has been passed which will enable the President to make reductions in bonuses to veterans and in the number and pay of government employees, which will save at least a half billion dollars annually. The economic value of the 'beer' bill has been exaggerated, but it will produce additional revenues that will contribute toward the balancing of the federal budget. . . . .

"Fear has been replaced with optimism throughout the country. Increase of public confidence has been shown by innumerable public and private expressions and by advances in the security and commodity markets, although some proposed legislation, such as that for farm relief, has been received with misgivings by business."

Criticism of Proposed "Recovery" Legislation

April 22, 1933.—"A bill introduced by Senator Black of Alabama has been passed by the United States Senate to compel the establishment of a 30-hour working week (6 hours a day, and 5 days a week) in all large productive industries, manufacturing, mining, milling, etc. . . .

"The present administration and Congress, like their predecessors since the war, have devoted much time, thought and effort to devising and trying measures for the solution of the farm problem. . . . Many students of economics will be curious as to how the wise men in Washington can hope to re-establish the pre-war purchasing power of the farmers by new farm legislation, if it is to be accompanied by legislation to compel reduction of working hours in industry and transportation. . . . . If costs of production in manufacturing and other industries, and the operating expenses of railways and other carriers, are to be increased by hours of labor and minimum wage legislation, how are the prices and freight rates that the farmers must pay for the commodities and transportation they must buy going to be prevented from being so increased as to nullify any tendency that increases in the prices of farm products may have to restore the farmers' purchasing power? . . . . Relatively, the largest declines of purchases, production and employment have occurred in the 'capital goods' industries. . . . . A revival of the 'capital goods' industries is the principal thing needed to cause an early revival of general business and increase of employment; and yet the 'capital goods' industries and the railroads would be the hardest hit by reduction of the hours worked per day by employees if unaccompanied by corresponding reductions of daily rates of pay."

April 29, 1933.—"In view of the fact that the general trend of business has been decidedly better for almost eight months than it was before, in spite of serious retarding influences, many students of economics and business must seriously question the expediency of numerous kinds of legislation which are being advocated in Washington as essential to economic revival."

Increased Employment Result, Not Cause, of Prosperity

May 6, 1933.—"There is a consideration of great importance which is commonly disregarded in current reasoning concerning the effects of changes in wages and working hours. Prosperity cannot be restored merely by increasing the number of persons employed. Prosperity is measured not only by the distribution of what is produced, but by the total volume of production, which, of course, determines the amount of necessities, comforts and luxuries that can be distributed. . . . . The restoration of real prosperity can be accomplished only by measures which will not merely temporarily increase employment, but which will permanently double or treble production in industry, and the traffic of the railways. . . . . Any policy which has not increased production in industry as its main objective will make no permanent contribution either to increased employment or to increases in the real incomes of those who get employment."

May 20, 1933.—"While a real improvement in general business is occurring, public men and business men are considering numerous means of accelerating the improvement and restoring prosperity. It is of the utmost importance that the measures adopted shall be selected with great care and due regard for experience. Otherwise, while they may prove temporarily stimulating, they may

cause reactions which will prolong or renew the depression. . . . . There is an evident determination in Washington to use large amounts of government money to stimulate a revival of business. The less of it is spent on public works of doubtful value, and the more of it is spent to increase employment in the private industries in which the decline in employment has occurred, the better it will be for everybody."

The "New Deal" Begins

June 24, 1933.—"The 'new deal' in the economic affairs of the United States began when Congress adjourned last week. The legislation passed in accordance with President Roosevelt's program . . . . gives the federal government more supervision and control over every important form of industry and commerce, than ever existed before in this country in time of peace. . . . . It is, however, seriously questionable whether the heroic measures adopted were not ceasing to be needed and what effects they will produce. . . . . As to the parts of its program embodied in more recent legislation, all that can be said at present is that they are novel to the point of being revolutionary, and that their success will depend largely upon the way in which the new legislation is administered, and especially upon the success attained in preventing its economic purposes from being vitiated by political influences."

July 15, 1933.—"As the improvement actually began ten months ago, it is plain it has been mainly due to the same general economic causes which terminated all previous depressions. As it has been more rapid within recent months, it undoubtedly has been due, in considerable measure, to prospective inflation and increased buying of commodities to anticipate advances in commodity prices. . . . . It is especially necessary to increase the demand for and production of 'capital goods'. . . . . The *Railway Age* is frankly skeptical regarding the extent to which general business will be either temporarily stimulated or permanently benefited by the government's public works program, or by any policy of actual inflation which it may adopt. . . . . The government can help or hinder, but government direction and action can never, until a complete policy of socialism has been adopted, serve as a substitute for private initiative and enterprise."

"Economic Recovery or Revolution?"

September 30, 1933.—"Reports from Washington are unanimous that the administrators of the government's recovery policies have begun to realize that one of the most serious weaknesses in their program has been that it has not tended sufficiently to stimulate the recovery of the 'capital goods' industries. . . . . That problem can be solved only by facing the facts regarding the motives that really influence business men in general and adopting policies based upon them. . . . . It has been an announced part of the administration's policy for business to forego immediate reductions in its losses or increases of its profits in order to make larger increases in employment and wages than it is assumed would be practicable if the usual efforts were made to reduce losses or increase profits. Obviously, however, increases in losses or reductions of profits in other industries reduce their ability to make purchases from the capital goods industries. . . . .

"The trouble with certain half-baked economic theories that recently have been widely disseminated and accepted is, that they disregard facts of the most vital importance; that among these facts are, that that large part of the important industries of this country which is devoted to the production of capital goods has been developed to provide means of increasing production and reducing the labor cost of production; that the sole motive of business men in trying to increase production and reduce its cost is to reduce losses or increase profits; and that therefore any government policy which even temporarily discourages efforts to reduce losses or increase profits tends directly to prevent revival of the capital goods industries and of employment by them."

October 21, 1933.—"Action by the national government under the present administration in behalf of recovery was begun by securing the passage of some seventeen 'emergency' laws which were signed by the President between March 9 and June 16. The provisions of most of these laws and their subsequent administration make plain that they are intended to promote not only recovery from the depression, but an economic and social revolution. From their inception many persons who have devoted much of their lives to the study of economic and business history and problems have questioned whether the effort to accomplish a revolution would not interfere with the efforts to promote recovery."

"Developments during the last fifteen months strongly indicate that there has been good reason for such questioning. . . . . The figures show that there was a marked improvement in business during the last one-third of 1932, and another marked improvement during April to July, 1933, inclusive, during which the recovery policies of the administration affected business only by anticipation, while since July there has been a steady recession as a result of which in the two weeks ended October 7 business was only slightly better relatively than in June and only relatively as good as in December, 1932. . . . . The only new and important influences by which business has since been affected have been the administration's revolutionary policies; and developments under them have not altered our belief in the desirability of giving nature a large measure of opportunity in business in general, and on the railroads in particular."

Decline of Business Under "Recovery" Policies

November 4, 1933.—"Freight car loadings are the best single measure of the total volume of business activity, and, General Johnson to the contrary notwithstanding, they demonstrate that for three months the trend of business has been downward. . . . . It is essential to recovery that private industry shall be given opportunity to finance its expansion. As long as production and commerce are more than 40 per cent below the prosperity level, there can be no large and permanent increase of employment and pay rolls. As long as private industry cannot finance its expansion, there can be no large increase of production and commerce. Government policies which tend to monopolize the market for capital and to restrict profits in private business tend directly to delay financing of the expansion of private business. The vicious circle of cause and effect which is delaying economic recovery, and thereby delaying the increase of employment upon which the government so ineffectively puts so much stress, can be broken only by changes in government policies which, by stimulating private industry, will create a greater natural, and therefore effective, demand for capital goods and for labor with which to produce them."

December 16, 1933.—"Implicit in many statements emanating from the administrators of recovery is the assumption that redistribution of income is the essential objective because production cannot be greatly increased —that industry can now produce more than people will or can consume. . . . . In view of the industrial history

of the last one hundred years and of existing conditions, it is a preposterous exhibition of ignorance and lack of foresight to imply that the observance of sound economic principles by government and business will not cause future increases of production, commerce and the national income which will make the production, commerce and national income of recent years of prosperity seem small. . . . .

"Even in 1929 average income per capita in this country was only about $750. It will be just as possible to double, treble or quadruple it in the future as it was in the past. . . . . It is certainly true that experience in all countries which have grown rich, and especially in this country, indicates that the encouragement by the government of private initiative and enterprise is far more likely to help increase production, commerce and incomes than government hampering and discouragement of private initiative and enterprise. It is said that conditions are different now from what they ever were before. This statement, like pessimistic predictions, has been made by prominent persons during every industrial depression that has ever occurred. It is only partly true now, and no more true than in the past."

Railway Wages and Durable Goods Industries

February 24, 1934.—"The most important and difficult of the immediate problems of recovery is that of reviving business and employment in what are called the 'durable' or 'capital' goods industries. The very fact that they are called 'capital' goods industries indicates the nature of this problem. For the most part capital must be used in buying from them, and a company that has no profits cannot rise the capital required to do the buying. . . . . Until government and business can and do effectively co-operate to increase the profits in business which are necessary to make possible a large increase in buying from the durable goods industries there will be no real economic recovery in this country."

April 21, 1934.—"Taking the railroads as an example, what is the principal influence which causes an increase or decrease of their purchases from the durable goods industries? The *Railway Age* has thoroughly analyzed the statistics bearing upon this question for a period of years, and they demonstrate that the volume of railway purchases from year to year, and almost from month to month, is determined by the amount of net operating income that the railways earn. . . . . The issue presented in the railway wage controversy is not, therefore, merely one between railway security owners and railway employees. It is equally an issue between the employees of the railways and the millions who formerly were employed, and who want employment now, in the durable goods industries. The durable goods industries that are dependent upon the railroads for business cannot be revived if increases in railway payrolls are to be made which will largely reduce railway purchasing power."

Higher Wages Curtail Re-employment

April 28, 1934.—"The (railway wage) settlement reached is a gamble on the future trend of railway earnings—a gamble justified perhaps in the interest of peace, but a gamble nevertheless. The major portion of the proceeds of increased railway earnings should be used as the President proposed—either directly or as a basis for credit—for rehabilitating the railways' plant and equipment, if relief is to be given to those classes of workers who have been hardest hit by unemployment and part-time jobs. . . . . That a definite assignment of railway earnings has now been made to employees who have jobs, simply means that business will have to improve a lot faster than would otherwise have been necessary in order to re-employ idle railroaders and unemployed workers of the railway equipment and supply industry."

Increased Business Costs and Politics Menace Recovery

May 12, 1934.—"The principal menace to the continuing revival of business is that production costs and prices may be advanced more rapidly than economic conditions warrant, with the effect of impairing the buying power and effective demand of both industries and individuals. That advances in wages increase costs of production, and that increased costs of production necessitate advances in prices, seems axiomatic, but increases in the total volume of production and commerce are the things needed fully to revive business, and general advances in prices are a very doubtful means of increasing the demand for commodities. If, as some forecasters predict, there will be recession in business within the next few months, it will undoubtedly be due largely to increases in production costs and prices that are not economically warranted at this stage of recovery, and it will force individual concerns and entire industries to make readjustments essential to renewed progress toward recovery."

July 7, 1934.—"A review of recent railroad developments affords good illustrations of how much more important is politics than economics in the philosophy and activities of those now dominating affairs in the United States. . . . . The revival of the durable goods industries is now ostensiby the main objective of government policies, but Congress and the President could have done nothing more effective to reduce railroad buying from the durable goods industries than to have added this pension legislation to the advances in railway wages which began on July 1. In the face of government policies and official utterances seemingly designed to ruin rather than revive business there is only one sane thing business in general can do. This is to fight the devil with his own weapons. In order to protect itself business must resort to political propaganda and other political methods."

"Recovery" Policies, Business and Freight Rates

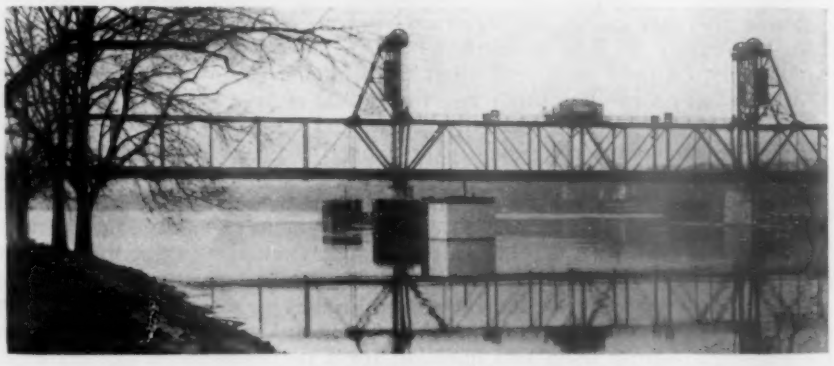
July 27, 1934.—"It is impossible to adopt some major unsound economic policies without apparently necessitating and justifying others. The adoption of one unsound economic policy after another has forced the railways to decide again to seek an advance in freight rates. . . . . The bottom of the depression was reached two years ago, in July, 1932. . . . . There then began an improvement in general business and traffic. . . . Doubtless the improvement would have continued throughout the last year but for the adoption of government policies to bleed, purge and dope business. As the *Railway Age* began predicting a year ago, the natural improvement has been constantly hindered by these artificial measures. . . . . Since March the improvement has been receding. Finally, in the two weeks ending with July 7 freight car loadings . . . . were actually less than in the corresponding two weeks of last year. . . . . With general business actually poorer now than it was a year ago, in spite of all the 'recovery' and 'reform' measures that have been adopted and ballyhooed, and of the unprecedented public expenditures, increases of taxation and forced advances in wages and prices that have been made, it does seem that those responsible for these policies would begin to see that they are not promoting, but retarding, recovery, and would give business a chance to revive itself."

At Seneca the Rock Island Converted a 151-ft. 8-in. Fixed Span Into a Vertical Lift Span

Convert Old Fixed Spans Into Vertical Lift Spans

Navigation requirements of Illinois Waterway lead to ingenious alterations of three railway bridges

HOW fixed spans in three old bridges that carry light traffic lines over the Illinois waterway were converted into vertical lift spans is one of the most interesting features of the extensive bridge work that the railways have been compelled to do in meeting the requirements of the government. This waterway project embraces the improvement of Illinois and DesPlaines rivers from the confluence of the former with the Mississippi river to a connection of the DesPlaines with the Chicago Sanitary District canal near Joliet, and has for its purpose the development of navigation between the Mississippi river and Lake Michigan.



Looking Downstream Toward the Burlington's Converted Lift Span at Ottawa

The three bridges referred to include the crossing of the Elgin, Joliet & Eastern's Wilmington branch near Divine, the crossing of the Kankakee & Seneca (now an industrial spur of the Chicago, Rock Island & Pacific) near Seneca, and the structure on the Aurora-Streator line of the Chicago, Burlington & Quincy at Ottawa. Each of these bridges embraces three or four through truss spans from 151 to 176 ft. long, built during the nineties, and while their capacities were therefore less than that provided for new structures, they could be strengthened readily to carry any loads to be imposed in the service on the lines on which they are located. Furthermore, studies disclosed the feasibility of converting the channel spans of these structures into lift spans, and proposals to meet the waterway requirements in this manner were approved by the government engineers.

The Work Involved

The principal requirements for these conversions were to provide towers over the ends of the flanking spans, to square up the ends of the lift span by providing vertical end posts and top chord members in the end panels, and to install new end floor beams and the necessary counterweights, counterweight sheaves, machinery and machinery houses. In addition, it was necessary to resort to some strengthening of the spans and to some alteration or strengthening of the piers, as well as to provide sheer booms for the protection of the piers and the boats using the waterway.

As the towers could be proportioned so that practically all the weight would be concentrated on the front legs, which were necessarily located directly over the bearings of the flanking spans, the superimposing of these towers on the old spans resulted in little increase in the load on them. No special problem was involved in attaching the rear legs of the towers to the hip joints of the spans, but the framing of the bottoms of the front legs into the lower ends of the end posts proved much more difficult. A somewhat similar problem was imposed in framing the new vertical members into the end panel points of the lift spans, but greater difficulty was encountered in the case of the tower legs because of the necessity for transmitting the entire load on these columns through the end pins of the spans into the new end bearings which had to be introduced to replace the original shoes, which were not adequate for the greater loads imposed.

In the Rock Island and Burlington bridges, the outstanding legs of the upper flange angles of the end posts

The Elgin, Joliet & Eastern Bridge Over the Illinois Waterway at Divine

were flame-cut flush with the flat legs of the angles so that two heavy gusset plates riveted to the two sides of the end post could project above it and provide the means for framing the tower columns into the joint. The new end floor beams were also riveted against the inside gusset plates. In the E. J. & E. bridge, the assembly at the joints was effected by means of cast steel diaphragms.

Unique Detail Aids Change

The substitution of new bearing shoes for the old ones, and the necessary alteration of the masonry were accomplished by a variety of methods which were developed to meet the particular conditions imposed in each case. Thus, the end bearing construction in the bridge at Ottawa imposed an unusual problem because of the unique means that had been employed to provide for expansion in these old spans. Instead of resting on rollers, the expansion end of each truss was suspended by means of two short eye-bars that engaged projecting ends of the end pin, from a second pin located about 30-in. above, which was, in turn, supported by a plate-and-angle pedestal that enclosed the end panel point of the truss and rested on the bridge seat.

In making the necessary alterations, these pedestals were cut away with a torch. The eye-bar links were replaced by U-bars which were looped under the projecting ends of the end pins and secured to yokes resting on needle beams spanning between blocking and jacks placed outside and inside the truss. With this rig it was possible to jack up the end of the span far enough to remove the old shoes and the old granite bearing blocks on which they rested, and install the new bearings, after which the necessary alterations were made on the end posts to permit the application of the gusset plates with which the new members were secured to them.

An Ingenious Expedient

In the bridge at Seneca, the end pins were not long enough either to be of use in lifting the spans off the bearings or to accommodate the wider shoes that were needed under the towers of the altered lift span. This gave rise to an ingenious construction that provided at once for jacking the span off the old bearings and for the replacement of the pins with longer ones. A primary requisite of this operation was some means of taking the tension in the end panels of the bottom chords during the time that the end pins were out and the eye-bars of the bottom chord were ineffective. This was accomplished by bolting plates against the insides of the end post webs just above the bottom chord, these plates projecting out of the end post far enough to provide room for a pin hole, by means of which temporary loop bars, rods and clevises could be attached to take the place of the bottom chord eye-bars. These rods were provided with turn-buckles so that the stress could readily be transferred to them from the eye-bars. In addition, a diaphragm was introduced between these temporary pin plates in a position such that blocking and jacks placed directly under it would clear the bearing casting.

On this bridge it was necessary to jacket the piers and rebuild the bridge seats at a lower elevation. The jackets around the old piers were constructed first to the bottom elevation of grillage. This provided room for placing the blocking and jacks. The tops of the piers were then cut down around the old bearing shoes, after which the spans were jacked up as described above. Then, after removing the old shoes, the remainder of the pier tops was cut down, and the grillages, new shoes, pins and bottom chord eye-bars were installed. The finishing of the piers to the new elevation followed.

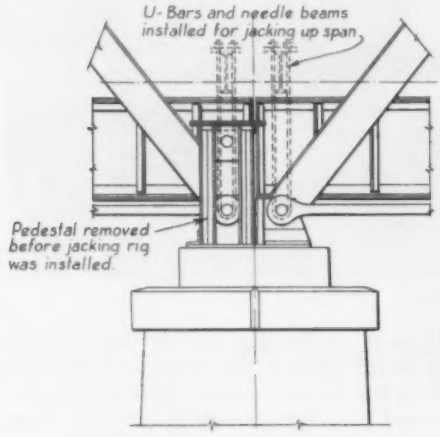
The next step was to remove the temporary bottom chord members, unbolt the temporary pin plates and place the new gusset plates and end floor beams. With this

A View of Machinery House and One of the Towers of the Burlington Lift Span at Ottawa

work completed, it was possible to proceed with the erection of the towers and the lifting members of the lift span.

Work on the Bridge at Divine

In the bridge at Divine, it was necessary to lower the bridge seats 2 ft. 4 in. and increase the lengths of the two piers supporting the lift span and the counterweight towers. This required the placing of 143 cu. yd. of concrete in each pier in adding a rounded end downstream



Method of Jacking Up the Spans of the Burlington Bridge for the Placing of the New Bearings

and a nozing upstream, together with the necessary footing extensions and a new bridge seat 2 ft. 8 in. thick that ties the two end extensions together. The end extensions were placed on piles that were cut off to the same elevation as the piles under the original piers. In addition, steel sheet piling was driven along the channel side of each of these piers to prevent loss of sand around the piles in the event of dredging in the channel.

All three of the converted lift spans were subjected to more or less reinforcement, ranging from the introduction of new lateral bracing to the strengthening of main members. In the Burlington span, bars 6 in. wide and from ½ in. to $^{13}/_{16}$ in. thick were riveted to the sides of the top chord members, and U-loops were introduced to reinforce the counters in the two middle panels.

In the E. J. & E. bridge, eye-bar diagonals were reinforced by welding channels to their outside faces and introducing diaphragms between the ends of these channels, close to the panel points. These diaphragms serve as the supports for yokes on which the nuts on U-bars bearing on the pins were turned up. In the C. R. I. & P. bridge the top and bottom laterals were replaced with heavier members.

Two Types of Hoisting Equipment

All three of the lift spans are provided with the usual arrangement of counterweights, counterweight ropes and sheaves, the maximum lift ranging from about 24 to 30 ft. However, there is a pronounced difference between the method of applying the power for raising and lowering the Burlington span and that employed on the other two spans, the former being operated by means of hoisting ropes attached to the bottoms and tops of the towers and wound around the drum of a hoisting engine in a house mounted on top of the movable span, while the latter are operated by means of motors geared to circumferential racks on the counterweight sheaves.

The lift span of the Burlington bridge at Ottawa is supported at each corner by eight 1⅜-in. wire ropes that pass over sheaves with an 8-ft. 6-in. pitch diameter and 8-in. shafts. The computed weight of the span, complete, is 454,800 lb. The haulage ropes are ¾ in. in diameter, the operating drum being geared to a Waukesha gasoline engine with four cylinders of 3⅝-in. bore and 4½-in. stroke and developing 24 hp. at 1200 r.p.m. Current for the starting motor and the ignition is supplied by a storage battery which is charged from a local public service lead. Limit switches that interrupt the ignition circuit of the gasoline engine provide adequate protection against over-travel in either the upward or downward direction. Movement of trains across the bridge is safeguarded by a mechanical interlocking plant operated from a four-lever machine in the operating house on the span.

The Rock Island lift span at Seneca, which has a length of 151 ft. 7⅞ in. between centers of end bearings, weighs 380,000 lb. complete, and is supported at each corner by six 1⅜-in. counterweight ropes. The counterweight sheaves have a 9-ft. pitch diameter and a 9¾-in. shaft and the counterweights consist of steel boxes filled with concrete. Fifty-six concrete blocks—13 in. by 22 in. by 10 in., weighing 238 lb. each, were provided for the final adjustment of the weight.

Direct Drive to Counterweight Sheaves

Movement of the span is effected by a 10-hp. General Electric motor on each tower, operating at 865 r.p.m. on 3-phase, 220-volt, 60-cycle current. The motor torque is transmitted through a Falk speed reduction gear, with a ratio of 70 to 1, to a 4½-in. countershaft that has 17-tooth pinions at each end which engage racks with 168 teeth that are secured to the sides of the counterweight sheaves. This equipment is designed to raise or lower the span a distance of 26 ft. 2¼ in. in 65 sec.

The control equipment is substantially the same as that provided on the Rock Island's White River bridge* at DeVall's Bluff, Ark., which was the first lift span to be operated by a gear drive on the counterweight sheaves. The control equipment, which is located in a metal house, 10 ft. by 18 ft., placed in the west tower at the level of the top chords of the span, embraces a master controller, a leveling controller that regulates the relative speed of the motors on the two towers, and a brake controller. A pointer on a dial indicates any variation of the span from level, due to faster travel of one end of the span relative to the other. The motors are stopped and started by the master controller, and the leveling controller is moved to the left or the right for the purpose of adjusting the relative speed of the two ends of the span to compensate for any deviation from level indi-

* This bridge was described in the *Railway Age* for June 11, 1927, page 1782.

In the Control House on the East Tower for the E. J. & E. Lift Span at Divine

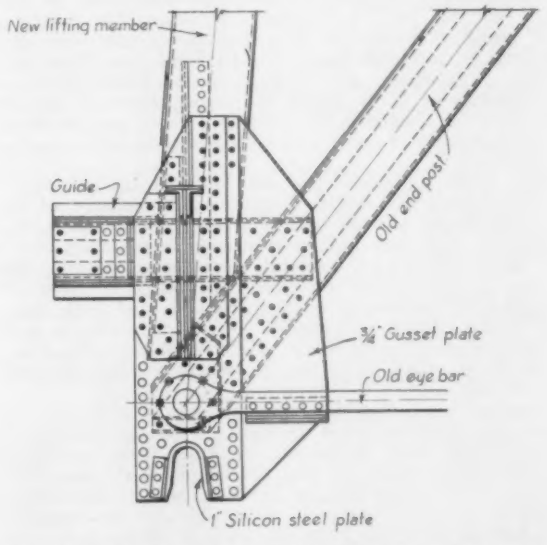
cated on the dial. Limit switches cut off the current as the span approaches the ends of its travel and applies the solenoid brakes, and it can be restored only by returning the controller handle to neutral position, following which the movement can be completed at a restricted speed.

As this bridge is used only for daily switching movements to and from an industrial plant, no interlocking plant is provided and no operator is assigned to the house.

For this reason, the span is normally kept placed in the open position and is operated by a signal maintainer who accompanies the switch engine to the bridge. The platform on which the control house has been erected has been placed at such an elevation that when the span is in the open position, it will be level with a walk cantilevered from one side of the floor on the lift span. Thus, the operator may use the stairway in either tower in order to reach the house when the span is in the raised position.

Automatic Leveling on E. J. & E. Bridge

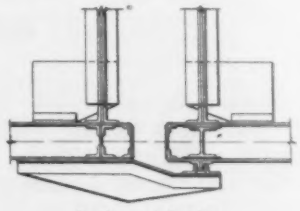
The E. J. & E. lift span weighs 350,000 lb., and is equipped with six 1⅜-in. wire ropes at each corner that pass over 9-ft. sheaves to the counterweight. The sheaves in each tower are geared through a Falk speed reducer to duplicate 10-hp. a.c. General Electric motors operating on 3-phase, 220-volt, 60-cycle current, and mounted on the same shaft. One of these functions as the prime mover, while the other serves as the synchronizing unit in a Selsyn system of control which insures that the two ends of the span remain at the same elevation relative to each other during the vertical movement.† In addition to the leveling control, the operation of the bridge is safeguarded by limit switches that cut off the power and apply solenoid brakes on the motor shafts

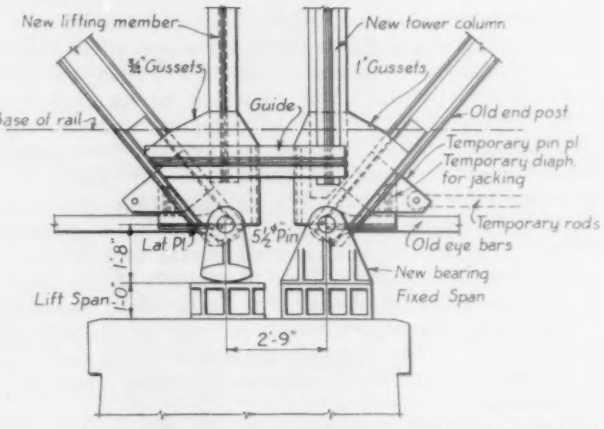


How the Lifting Members and the Guides Were Framed Into the Ends of the Old Fixed Span of the Burlington Bridge

when the span has moved to within two feet of the fully open or the fully closed positions, following which the operator must restore the controller to the neutral position and press the seating button in order to restore the motor circuit, this being limited in this case to the first two notches on the controller.

Traffic is safeguarded by a permanent color-light stop signal and a spring derail at each end of bridge. The derails are operated manually for facing point movements and trailed through on trailing movements. The bridge control circuit is selected through circuit controllers on the derails and the bridge rail locks in such manner as to prevent the application of power to the bridge operating motors unless the derails are open and the rail locks are withdrawn.





Sketch of Bearing Assembly on One of the Piers of the Rock Island Bridge, Showing the Method of Applying the New Material and the Temporary Construction Used in Making the Alterations

Bridge Normally Open

This bridge is on a line of light traffic on which train movements are ordinarily confined to a single 8-hour shift so that but one operator is employed. Consequently, the bridge is in the open position during 16 hours out of every 24, and is usually in the open position during the operator's tour of duty. Because of this, a gate has been suspended from the bottom of each counterweight, which serves as a barrier across the track when the lift span is in the open position, to prevent trespassers or railway employees from the danger of falling into the waterway.

The alterations on the Burlington bridge at Ottawa were carried out under the direction of G. A. Haggander, bridge engineer; Williams & Brown, of New York, serving as consulting engineers. The steel work was fabricated by the American Bridge Company, New York, and erected by the McClintic-Marshall Company, Pittsburgh, Pa.

The work on the Rock Island bridge at Seneca was under the supervision of I. L. Simmons, bridge engineer. The structural steel and operating equipment were supplied by the American Bridge Company and were erected by the Strobel Steel Construction Company of Chicago.

The alterations on the E. J. & E. bridge at Divine were made under the supervision of A. Montzheimer, chief engineer.

The American Bridge Company, which supplied the steel work and operating equipment, collaborated in the design. The substructure work was done by the Walsh Construction Company, Davenport, Iowa.

† This system was described in detail in an article on the M-K-T bridge over the Missouri river at Boonville, Mo., in the *Railway Age* of April 30, 1932, page 729.

Empty Mileage and Car Pooling

Co-ordinator and his car pooling section criticize defensive attitude of railroad committee

WASHINGTON, D. C.

PAVING the way for specific recommendations which he promises to submit later, Co-ordinator Eastman's office on August 3 made public a letter addressed to the Regional Co-ordinating Committees enclosing a reply prepared by his Section of Car Pooling to a report submitted by the General Committee, Transportation Division, of the American Railway Association, covering a study made by a special committee of transportation officers of the Co-ordinator's statement of October 10, 1933, in which he had asked the committees to study methods of reducing wasteful empty car mileage. Stating that car pooling was "one possible method" which would be considered Mr. Eastman at that time gave the committees an opportunity to develop "a remedy or remedies more practicable or otherwise better" than any which his staff would find it possible to develop, but he finds that "the results of the inquiry are disappointing" and says that "after eight months of deliberations, the report, which is made up in large part of a defense of existing policies and methods and which is lacking in constructive recommendations, comes as an 'anti-climax'."

The Car Pooling Section in its statement says that "the presentation of a pool plan, with facts and arguments in support of the plan, will be made at the proper time" and that it is confining itself at this time to comments "directed to the apparent fallacies in the rather superficial discussion of the subject" by the railroad committee. A considerable part of the statement is devoted to replies to the committee arguments against pooling, and its statement that "the careful investigation, and inquiry of a large group of railroad officers who by experience are duly qualified to advise on the subject, leads to the conclusion that pooling of box cars is neither desirable nor necessary to effect such reduction of empty mileage as is practicable."

"When it is considered that the freight car equipment of American railroads represents an original investment of $3,000,000,000 and that upon the adequacy and the efficient distribution of this equipment depend not only the prosperity of the railroads, but the economic welfare of the nation," the Car Pooling Section remarks, "it is amazing that serious proposals for reforms have been so often approached in an attitude which combines ostrich-like obliviousness of conditions with adherence to outgrown methods which have been but indifferently effectual in normal periods, and which have proved entirely inadequate in times of emergency."

The Co-ordinator's letter was dated July 26, although Mr. Eastman has for some time been away on a vacation trip. With it was furnished a copy of the railroad committee's report, which he says was distributed to the railroads in advance of its submission to him. The letter includes the following:

Eastman's Letter

On October 10, 1933, I enclosed to you a statement in which were summarized reports made by the larger railroads, covering the movement of loaded and empty box cars during the first week in August, 1933. I referred to the fact that despite the decline in railroad traffic and the consequent need for operating economies, the crosshaul movement of empty cars, which has been a disturbing subject for more than thirty years, continues unchecked.

As illustrative of the importance of this item of railroad operation, I stated that the result of the change in relationship between revenue net ton-miles and empty car-miles from 1920 to 1932 was equivalent to an increase of two billion six hundred million empty car-miles in the latter year. As partially revealing the extent to which this enormous empty mileage is due to the unnecessary and avoidable cross-haul movement of empty cars, I called attention to some of the striking results of our study of one week's actual performance. It was shown that nearly one-half of the total loaded box car mileage and approximately two-thirds of that produced by carload traffic are made by "foreign cars," illustrating how the interline movement of freight and the development of rules of interchange have transformed the individually-owned box car into a facility of common use. It was further shown how the policy of common use is abandoned as soon as the car becomes empty, with the result that there is a continuous flow of "foreign cars" moving empty toward their home lines.

While there is a natural and largely unavoidable balancing empty movement, which in the study averaged 73.3 per cent, the statement showed a movement *in the direction of traffic* of 24.1 empty "foreign cars" for each 100 loads. As striking evidence that this movement is largely the result of existing methods of car handling, it was cited that the empty ratio of "system cars" in the direction of traffic was only 15.8 per cent.

In submitting the matter to the Regional Co-ordinating Committee, I expressed the thought that these committees might be able, through the facilities at their disposal, to devise some method whereby the wasteful empty mileage could be reduced.

On June 12, 1934, I received a report of the inquiry made by a special committee of Transportation Department Officers, appointed by and representing the Regional Co-ordinating Committees. The results of the inquiry are disappointing. After eight months of deliberations, the report, which is made up in large part of a defense of existing policies and methods and which is lacking in constructive recommendations, comes as an anti-climax.

I am loath to believe that the practical transportation men who constituted the special committee are unaware of the unnecessary empty mileage which is being created daily in great volume, or that they unanimously endorse the rules and practices under which such wasteful operation is possible. On the contrary I am reliably informed that many of those officers recognize the defects in existing methods and that they have individually adopted such devices as were available in an effort to eliminate some of the waste. As a result there has been some reduction in empty crosshaul movement during the past six or eight months.

It is significant that the report is sponsored by the General Committee, Transportation Division, American Railway Association, which body formulates the rules under which freight cars are interchanged, and that the inquiry itself was under the direction of the Car Service Division, which organization for a number of years has been responsible for the regulation of car handling under the rules currently in effect.

Inasmuch as the substantiation of the evidence of wasteful car handling might be construed as a reflection upon the soundness of car-handling rules, or upon their efficient supervision, the propriety of placing the inquiry so completely in the hands of those responsible for the rules and their application is open to question. Whether or not this situation influenced or controlled the course of the inquiry, the report bears a remarkable resemblance to past reports on similar inquiries into the fundamentals of car handling conducted under the same direction.

Official reports are authority for the statement that in one of these past inquiries apprehension was expressed by several executives that "the present rules may have been prepared by the transportation officers under restrictions which precluded the full result of their experience and best judgment".

Considerable space in the report is devoted to an effort to minimize the importance of the empty mileage figures included in our summary and to refute some of the conclusions which we undertook to draw from these reports of actual performance.

Another section of the report is made up of discussions of various methods of car handling, including a somewhat superficial consideration of car pooling.

The "Recommendations" which form the concluding portion of the report do not include a single fundamental change.

One of the methods proposed as a corrective of the empty crosshaul movement is the payment of a reward or premium to be allowed to railroads for utilizing the equipment of other railroads, apparently without regard to the adequacy of the car supply on the loading road, or to the circumstances which may vary widely in different loading territories.

Another suggestion is the extension of certain local arrangement for economical handling which resourceful railroads have been forced to adopt by the inadequacy of the present car-handling system. Reference to the possible coordination of these efforts under central guidance is included, but no specific means for effecting such coordination are proposed.

The third and final recommendation is directed to a closer observance of Car Service Rule I.

This rule admittedly is susceptible to various interpretations, and 14 years of intensive and expensive supervision have failed to make it work. Current checks by Car Service Division inspectors show approximately 20 per cent of so-called "violations" of car service rules. There is little ground for hope that the recommendations of the special committee will meet with any greater success.

While I am not disposed to delay further action by engaging in a statistical controversy on this subject, it seems important that we undertake to clarify certain misunderstandings and to correct some erroneous conclusions, to pave the way for specific recommendations which I shall later submit.

Comments of the Car Pooling Section

The general comments of the Section of Car Pooling are as follows:

The report consists of three parts and five appendices. Part I is an analysis of the box-car study the submission of which on October 10, 1933, led to the appointment of a special committee, of whose activities the report is the result. Much of the discussion in this section of the report is general and argumentative, dealing with elementary principles of transportation efficiency and with various changes in conditions during the past 15 years, regarding which there is no controversy. Exception is taken in the report to the basis of comparison used in the box-car study and the empty mileage figures are broken down by means of an unexplained formula in an effort to show that a considerable proportion of the so-called "excess" empty mileage developed in our check of box-car movements is necessary in the orderly distribution of equipment and cannot reasonably be classed as avoidable.

The net result of the analysis is to reduce to a minimum the amount of empty mileage which the report considers avoidable. The report specifically states, "There is, however, a residue of avoidable empty mileage worth saving, and recommendations to that end will be found in Part II." The report then cites some of the methods resorted to by the railroads individually and collectively, supplementary to and supplanting Car Service and Per Diem Rules, for the purpose of reducing empty mileage. This section of the report concludes with laudatory comments on the efficiency of the Car Service Division and an implied suggestion that better results might be secured by "concentrating on known weaknesses through channels already available", than by means of new methods.

Part II consists of an analysis and discussion of ways and means to reduce empty car mileage. In this section, also, those responsible for the report apparently felt called upon to defend existing methods and to cite general conditions which, in their opinion, justify the alarming increase in empty car mileage in recent years. The discussion of car-handling methods is largely negative in character, more attention seemingly being devoted to the task of finding reasons why different methods will not work than to a search for possible improvements. Although the discussion of car pooling occupies about five pages, there is no reference to any specific form of car pool, nor any indication that an effort was made to develop practical plans for a car pool.

Part III submits conclusions and recommendations. The "conclusions" are largely negative, with the exception of an admission that a comparatively small amount of empty mileage is susceptible of reduction, the statement that there has been a downward trend of empty mileage in recent months, and the optimistic prediction that with "increased business, combined with the efforts currently made by the railroads and the Car Service Division, there will be a further reduction."

The "recommendations" are brief and contain little that is original and nothing which, on the basis of past experience, can be considered practicable.

While we are extremely anxious to avoid having this discussion develop into a controversy which will retard the adoption of methods for the partial or complete correction of unsatisfactory conditions, it is desirable that an effort be made to reconcile conflicting interpretations of demonstrated facts. We have, therefore, undertaken to analyze in detail some of the statements advanced in this report, in an effort to clarify misunderstandings and to remove from the consideration of the empty mileage problem such items as have no proper bearing upon the question in its present status. Our comments follow in the order in which the subjects are presented in the report.

In our consideration of the report we have had in mind the conditions under which the special committee were working, and the fact that they relied largely upon American Railway Association sources for the data relative to car performance and traffic. Our comments should not be interpreted, therefore, as a personal reflection upon the knowledge, experience or sincerity of the individual committee members, many of whom have rendered valuable assistance to the Co-ordinator and his staff in various special capacities.

Following are some of the more detailed comments on the report, signed by O. C. Castle, director of the Section of Car Pooling:

We have no desire to derogate from the many creditable accomplishments of railroad associations and their committees, but it is unfortunately true that, in general, association committee work has been unwieldly and frequently ineffective. In numerous instances, where conscientious committee members have contributed of their knowledge and experience to the formulation of rules and recommended changes in practice, their recommendations have either been stifled in committee through executive orders governed by a policy of the controlling minority, disapproved by the parent associations, or defeated by minority votes in letter ballots.

The Per Diem Plan

In defense of the per diem plan, reference is made in the report to a "public satisfied with service rendered." In other parts of the report the public angle is injected. It is sufficient here, however, to say that strict adherence to the principles of car service rules (which has never been possible of attainment) would result in great inconvenience to the public through the enforcement of arbitrary restrictions on the use of cars by shippers; in fact, it is only through disregard of the rules that the public has been kept satisfied. The Car Service Division in policing the observance of car service rules makes a regular check of the loading of foreign box cars. In 27 months, ending with March, 1934, 195,337 cars were checked out of approximately 31 million box cars loaded. Of cars loaded at freight houses and transfer platforms 10.8 per cent were loaded contrary to the rules; 32.6 per cent, or nearly one-third of the industry loads, constituted so-called "violations."

It is asserted that "there has been no serious demand for any basic change in methods of car hire settlement among car owners." In view of the fact that the demands for basic changes during the past 14 years resulted in railroad association consideration, Interstate Commerce Commission hearings, the introduction of legislation in Congress, and intensive discussions of the matter in the official report of the Joint Commission on Agricultural Inquiry (1922), there may be some doubt as to the lack of a "serious demand."

It is further a matter of common knowledge partially supported by official records that there has been, during the past 14 years, growing dissatisfaction on the part of practical car officers with conditions, and open disregard of the effort of the Car Service Division to enforce existing rules. That there is a fundamental defect in present methods is indicated by the reference in the report to the fact that "literally hundreds of short-routing agreements are in effect between railroads and groups of railroads, and that incomplete figures indicate an average saving of more than 500,000 empty miles monthly through these individual efforts." This subject is handled in further detail in our comments on "Car Pooling."

Car Pooling

Several pages of the report are devoted to a general discussion of car pooling, without, however, including a definition of the term, or giving any indication of what the committee members had in mind respecting the essential features of a freight car pool.

The discussion is prefaced with the statement: "By reason of the source from which the suggestion now comes, and because the Federal Co-ordinator has established within his organization a Section of Car Pooling for the purpose of exploring the pos-

sibilities of the plan, the subject now assumes a new and added importance which requires the consideration of transportation men in the light of present-day railroad operating conditions."

The text of the discussion is largely argumentative and does not differ materially from the stereotyped assumptions which have been from time to time advanced as objections to the adoption of pooling methods. In its opening reference to a car pool, the report states that "it has been tried and although it was thought by some to have been fairly successful, the general verdict was that there was something lacking which must be supplied before complete approval could be given."

The reference here is presumably to the period of federal control. No one familiar with the operation during the emergency of the World War would deny that there was "something lacking." The amazing fact is that there is no evidence of any sincere effort on the part of the railroads in the past 14 years to ascertain what the lack was and to adopt some means to supply it. It is significant that among those who thought that the pool was "fairly successful" were the Interstate Commerce Commission, the chairman of the Car Service Division, which organization was in direct charge of car handling, and the Director General of Railroads.

As stated by Chairman Kendall, (of the Car Service Section) the principal defect in the federal operation was the lack of a definite maintenance program, although under war-time conditions it is probable that maintenance would have been unsatisfactory under any plan which might have been set up. Reference is made to the experience of grain shippers in the Western area and the general dissatisfaction which existed, the obvious implication being that these difficulties were chargeable entirely to the so-called pool and the inability of the Administration to overcome conditions which created a general car shortage. Without going into the details of these failures or the abnormal conditions under which they occurred, it seems proper to point out that even a casual exploration of official records over a period of years will reveal many instances of car shortages under individual operation.

It is stated that the committee had before it for advice and counsel, transportation representatives of 38 of the larger railroads and that only two of these men were favorable to the pool, the majority being "outspoken in denial of the virtues claimed." Inasmuch as there is nothing in the report to indicate the form of the pool under discussion or that the railroad representatives and the committee members had before them any definite plans for a practical car pool, these expressions, even though they were voluntary and free expressions of individual views, are entitled to very little weight. Further, there is evidence that the expressions were not in all cases voluntary or entirely free from official influence.

Reference is made to the fact that many representatives, once proponents, have now become opponents of the pooling plan, and that the reverse is not true. It is stated that the weight of opinion is cast "as a result of experience." It is significant that many prominent proponents of car pooling became opponents practically over night as a result of a definite policy adopted by the railroads on their release from federal control.

Among those who had been more or less prominently identified with the car-pool school but who subsequently ranged themselves with the advocates of "strict ownership rules" are the chairman of the board of the American Railway Association, and many officers in direct charge of car handling during federal control, including the present chairman of the Car Service Division—from whose official reports we have quoted.

It is further significant that efforts to bring about impartial consideration of pool plans since the period of federal control have been definitely suppressed by executive authority.

In view of the repulses experienced by advocates of reform in car handling, including threatened loss of position, is it surprising that there is little enthusiastic sentiment now apparent among transportation men for the adoption of some plan of car pooling?

The report attributes the present attitude of car men to "the weight of opinion as a result of experience and of more mature judgment." The experience of the majority of those who were heard has been with one method of car handling which, for reasons stated elsewhere, has been found deficient. The "mature judgment" conceivably was influenced by the instinct of self-preservation and the tendency to follow the line of least resistance.

In the face of the record of 14 years' unsuccessful effort to enforce Car Service Rule I, the reliance upon this ambiguous declaration of principle as a solution of the empty mileage problem is a perfect example of the triumph of faith over experience.

Railroad Committee's Recommendations

1. The comparisons included in the Co-ordinator's release by which there is shown to have been a 62.8 per cent increase in empty car miles is misleading. While the statement is mathematically correct the periods chosen for comparison are not properly comparable, hence deductions therefrom create erroneous impressions. There has been a slight upward trend in the ratio of empty mileage from 1923 to 1932, but the increase has very largely been the result of meeting the changed transportation requirements of the country, and not to the failure of railroads as a whole to exercise diligence with respect to economical car handling.

2. No instances were located of extra train mileage being made to move empty cars which were included in the reports to the Co-ordinator. In all cases it was found that cars were added to trains which were necessary for handling the regular traffic. The expense of such movements was, therefore, nominal.

3. Investigation and analysis of reports of box car mileage for period August 1 to 7, 1933, as rendered to the Co-ordinator indicates that there is a comparatively small amount of such mileage susceptible of reduction. Ways and means to effect this reduction may be found and should be applied.

4. Consideration has been given to the proposal that roads readopt the mileage basis of car hire settlement which was in effect prior to 1902. While the adoption of such a plan would very likely have some effect toward curtailing mileage now made because of the incentive to save as well as to earn per diem the disadvantages of the mileage basis are as controlling now as they were 30 years ago. There appears more to lose than to gain by a change from the per diem to the mileage basis.

5. Pooling has been suggested as a means of reducing empty mileage. The careful investigation, and inquiry of a large group of railroad officers who by experience are duly qualified to advise on the subject, leads to the conclusion that pooling of box cars is neither desirable nor necessary to effect such reduction of empty mileage as is practicable. A pool of box cars should not be favored for reasons given in more detail on pages 19 to 24 inclusive of Part II.

6. With the ratio of empty mileage remaining at substantially the same level during the years of heavy business, 1926 to 1929, inclusive, with a two point rise in the succeeding depression years, and with a downward trend as business turned upward in 1933, it is a reasonable assumption that with increased business, combined with the efforts currently made by the railroads and the Car Service Division, there will be a further reduction.

Railroad Committee's Recommendations

1. Conforming to the expressed opinion of a wide group of transportation and car service officers as to its desirability and practicability, it is recommended that consideration be given by the appropriate committees of the Transportation Division to the adoption of a rule or a plan whereby a special reclaim of a specified number of days be allowed as between car owners for loading a car to or via the home road, such reclaim to compensate for holding, conditioning and switching a car for the prospective available load.

2. That the possibilities of further reduction in empty mileage to be found through the medium of short-routing, trading, or "frozen" per diem plans, be explored by railroads individually and in co-operation with the Car Service Division, so that the widest possible application of these principles in car handling may be had.

3. A considerable portion of the avoidable empty mileage as developed in the reports made to the Co-ordinator, might possibly have been saved had there been closer observance of Car Service Rule I. It is important in connection with a program for proper and economical car handling that strict observance of this rule be required, although it may add slightly to the per diem or switching expense.

Freight Car Loading

WASHINGTON, D. C.

LOADING of revenue freight for the week ended July 28 totaled 608,848 cars, a decrease of 6,016 cars as compared with the week before and of 35,991 cars as compared with the corresponding week of last year. This was the fourth consecutive week to show a decrease as compared with 1933. The total for the week was, however, an increase of 97,745 cars as compared with 1932. Live stock loading, 26,295 cars, showed an increase as compared both with the week before and with the corresponding week of last year. Coal and coke showed increases as compared with the preceding

week and ore and grain showed increases as compared with last year, but miscellaneous freight, merchandise, and forest products showed decreases as compared with the week before and also last year. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

Revenue Freight Car Loading

Week Ended Saturday, July 28, 1934

Districts	1934	1933	1932
Eastern	130,490	148,331	117,799
Allegheny	112,281	135,133	97,668
Pocahontas	42,861	50,211	33,774
Southern	80,348	90,042	71,945
Northwestern	95,673	88,427	63,375
Central Western	97,302	86,658	83,481
Southwestern	49,893	46,037	43,061
Total Western Districts	242,868	221,122	189,917
Total All Roads	608,848	644,839	511,103
Commodities			
Grain and Grain Products	43,611	33,529	40,504
Live Stock	26,295	15,080	14,505
Coal	100,717	129,773	87,343
Coke	4,528	6,810	2,319
Forest Products	21,715	28,017	15,409
Ore	30,803	28,282	6,447
Merchandise, L.C.L.	158,433	172,872	166,870
Miscellaneous	222,746	230,476	177,706
July 28	608,848	644,839	511,103
July 21	614,864	656,380	501,912
July 14	602,778	653,661	503,761
July 7	519,807	543,510	415,928
June 30	644,572	641,730	488,281
Cumulative total, 30 weeks	17,746,628	15,842,690	16,040,524

Car Loading in Canada

Car loadings in Canada for the week ended July 28, according to the compilation of the Dominion Bureau of Statistics, totaled 43,731, a decrease of 1,020 from the previous week, but an increase of 6,600 over 1933.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada:		
July 28, 1934	43,731	18,942
July 21, 1934	44,751	19,645
July 14, 1934	45,389	20,033
July 29, 1933	37,131	19,879
Cumulative Totals for Canada:		
July 28, 1934	1,268,271	679,495
July 29, 1933	1,057,112	538,344
July 30, 1932	1,226,959	590,259

Grouping of N. J. and New York Rates Approved

WASHINGTON, D. C.

HOLDING that freight rates in this country "are not, never have been, and should not be constructed solely with regard to the cost of specific operations which form but a part of the services rendered under the rates," and that "historically, geographically, and commercially the whole New York port district constitutes a single community," the Interstate Commerce Commission, in a report and order made public on August 2 in the New Jersey lighterage case, decided adversely to the contentions of the complaints filed by the state of New Jersey and the New Jersey Traffic Advisory Committee on October 31, 1929.

Upholding the "century-old practice" of equalizing the rates at all points in the port of New York district, the commission found not unlawful both the existing grouping of New Jersey and New York points at the port of New York, except on traffic to and from New England, as to which it held that the rates on class traffic to and from New Jersey points must not exceed those to and from the points within the New York lighterage limits, and the failure of the carriers to publish separate charges for lighterage, car floatage, and trucking at the port of New York.

Similarly the commission found that the rail-water and rail-water-rail rates between New Jersey and the South and Southwest are not unlawful and on a separate complaint filed by the city of Boston and the Boston Port Authority it found that the rates on export, import, coastwise, and intercoastal traffic to and from the port of Boston are not unlawful and that the storage-in-transit rules applicable at the port of New York are not unduly prejudicial.

However, the commission did find in favor of the New Jersey complainants on two minor points, prescribing a new basis of rates between New England and northern New Jersey points, and ordering a removal of extra towing charges to and from New Jersey points beyond the present lighterage limits.

Commissioner McManamy dissented in a long opinion in which Commissioners Porter and Tate joined.

The Majority Report

The majority report, by Commissioner Meyer, points out that the equalization practice was apparently satisfactory to all interests until 1917, when New Jersey interests sought rates to and from northern New Jersey lower than to New York by the amount of the cost of lighterage to New York in a complaint which the commission dismissed in its decision in the *New York harbor* case after an exhaustive investigation, and that "the instant proceedings are in large part a retrial of that case." The report continues:

> The issues and the facts are substantially the same now as they were then. There has been no material change in the methods of performing lighterage during the past 25 years, except those for the better inaugurated since the close of the hearings. Then, as now, general comparisons of the services rendered indicated "that the cost of delivery at interior points in New Jersey is decidedly less than the average cost of effecting delivery in New York harbor," and that the cost of delivering a car in Jersey City, Hoboken, or Bayonne is sometimes less and sometimes greater than the cost of harbor delivery. Then, as now, the evidence showed that historically, geographically, and commercially the whole New York port district constitutes a single community.
>
> We cannot here overlook and disregard what we were unable to overlook and disregard in *The New York Harbor case*, or overlook or disregard what we have heretofore consistently held for many years in other cases with respect to lighterage and car floatage being equivalent to necessary extensions of the rail lines, with respect to grouping of terminal districts, and with respect to the port differentials adjustment, and split the New York port district into two parts solely because the average cost of performing lighterage is claimed to exceed the average cost of effecting other deliveries in the harbor district, and notwithstanding that freight rates in this country, as we have repeatedly stated, are not, never have been, and should not be constructed solely with regard to the cost of specific operations which form but a part of the services rendered under the rates. These facts, together with the effect which the relief sought by complainants would have on the commerce of the country and the general public interest, cannot properly be overlooked and disregarded. Both the commerce of the country and the general public interest require the continued maintenance of such terminal groups as the New York, Hampton Roads, San Francisco, Chicago, and St. Louis groups.
>
> Complainants are justly entitled to the same grouping on traffic to and from New England as on traffic to and from the west, and accordingly we find that the rates assailed between New Jersey points included in the New York group on class rate traffic to and from points in trunk-line territory more than 100 miles from the port and points in New England more than 100 miles from Harlem river or Spuyten Duyvil are, and for the future will be, unreasonable to the extent that they exceed, or may exceed, the rates on like traffic between the same New England points and points within the lighterage limits now included in the New York group on class rate traffic to and from New England.
>
> Likewise complainants are entitled to as fair treatment with

respect to lighterage as are points in the New York section of the harbor, and accordingly we find that the rates assailed are, and for, the future will be, unduly prejudicial to New Jersey points to which extra towing charges now apply and unduly preferential of points within the lighterage limits. This undue prejudice and preference should be removed by either an extension of the lighterage limits or the establishment of corresponding charges for lighterage to points within the lighterage limits. This finding is limited to local traffic, for, as will hereinafter appear, we may not make such a finding with respect to export, import, coastwise or intercosatal traffic.

As previously stated, there is now no grouping at the port of rail-water and rail-water-rail rates. As also previously stated all of these rates, except those through the port of Savannah, are in issue in the reopened *Consolidated Southwestern Cases*, now pending before us. This record does not warrant the conclusion that these assailed rates are unlawful. Our finding in this respect is, of course, without prejudice to whatever different conclusions may be reached in the case last cited.

The evidence of record cannot be accepted as proving that the cost of transportation, including the terminal services at the ports, is less to Boston than to New York. The cost computations upon which the Boston complainants rely fall far short of establishing that to be the fact. Operating and transportation conditions are not as favorable in New England as in the remainder of official territory. While the Boston complainants seek export and import rates no higher than Baltimore, the Baltimore interveners show that cost computations similar to those relied upon to show a higher cost of transportation to Boston than to New York would increase Baltimore's differential under Boston.

If we could assume that the cost of transportation to Boston is less than to New York, we would not be warranted, merely because of that assumption, in disrupting the whole port differentials adjustment for reasons already set forth in connection with the New Jersey complaints.

It is unnecessary to consider the merits of complainants' contention that the storage-in-transit rules applicable at New York are unduly prejudicial to Boston. It is sufficient to state that the New York Central, through its lease of the Boston & Albany, and the New Haven are the only carriers serving both ports; that the New Haven does not accord storage-in-transit at New York; that the rules of the New York Central applicable at New York are the same as those of the other carriers serving that port; that obviously the New York Central could not correct the situation complained of with the other lines serving Boston, as well as the other lines serving New York, free to maintain their present practices; and that under such circumstances the New York Central can not be found guilty of undue prejudice.

The foregoing conclusions, except as otherwise indicated, are applicable alike to the rates on export, import, coastwise, intercoastal, and local traffic. There are, however, additional reasons why we may not condemn the rates on export, import, coastwise, and intercoastal traffic. Since the submission of this case the Supreme Court has rendered its decision in *Texas & P. Ry. Co.* v. *United States, supra*, in which it was held that a port is not a "locality" within the meaning of section 3 of the interstate commerce act as respects traffic passing through it.

In view of this decision it seems clear that we may not condemn under section 3 of the act the existing relation of rates on export, import, coastwise and intercoastal traffic between the various ports. It also seems clear that as to such traffic we may not condemn under section 1 of the act the existing relation of rates unless we can find that the rates to one of the ports or one section of the same port, as the case may be, are unreasonably high or that those to other ports, or other sections of the same port, are unreasonably low. Such findings are not warranted upon this record.

Complainants had contended that because of the unusual and exceptionally costly terminal services necessary to serve the New York side and not necessary to serve the New Jersey side, the port should be divided into two parts, one composed of New Jersey points at which track delivery is made, and the other, with higher rates, composed of points where delivery is made by lighter, car float, or truck. Complainants also contended that, as they pay the same rates as shippers who receive terminal services by lighter, car float, or truck, they are in effect paying for an expensive terminal service which they do not receive, and that as a result of the present rate adjustment New Jersey has been deprived of its natural advantage of location and has not received its full share of the steamship business of the port, as a consequence of which its business activity, employment, population, and property values are subnormal. As to this the report says:

It will thus be seen that the main issue in these complaints is with respect to the method of constructing all rates to and from the port and the relation of the rates between the two sections in which complainants would divide the port, rather than with respect to the level of each of the thousands of rates to and from the port; and that complainants' main reliance in justification of their proposal to split the port into two sections is based in part upon differences in the character and in part upon differences in the cost of the terminal services necessary to serve the two sections.

The record does not show that the rate adjustment here assailed is responsible for New Jersey having a smaller percentage of its piers used by steamships than New York. Neither does the record show that New Jersey has suffered losses in business activity, employment, population, or property values; on the contrary it establishes the opposite. Hoboken, in which are located most of the New Jersey piers, is the only point which appears to have suffered losses. That seems to have been due primarily to the diversion of the vessels of such important lines as the North German Lloyd and Hamburg-American to Manhattan and Brooklyn piers after having been taken over by the government upon its entrance into the World War, and not to the rate adjustment. The record is convincing that under the present rate adjustment northern New Jersey has prospered.

We cannot assume, as do complainants, that the terminal services necessary to make track delivery at New Jersey points at the port of New York are the same and cost the same as the services to the rail heads on traffic moving beyond by lighter, carfloat, or truck. On the contrary, the record warrants the conclusion that generally they are greater and more costly, and that in at least some instances they are greater and more costly than some of the marine terminal services, particularly when consideration is given to the fact that large investments in rights of way and track are necessary to make the various track deliveries which are not necessary to perform the marine services. While the costs of performing the marine terminal services probably do not differ greatly from what they were in October, 1924, the record is insufficient upon which to base a conclusion that that is the fact.

However, we have never prescribed rates based solely on the cost of service. In every group adjustment some points in the group are more favorably located and require less transportation service than others. Something more than a disparity in the amount or cost of the services performed for different shippers within the group is necessary to a finding that the group rate is unlawful. If this were not so, every group rate would have to be condemned, with the result that the entire rate structure of the country would have to be remade.

As previously stated, lighterage has been in effect at the port of New York since the beginning of rail transportation thereto, and car floatage almost as long. Competition of the railroads with the Erie Canal and with each other occasioned their establishment. Such competition, the exceedingly rapid growth of Manhattan Island, and the geographical situation at New York harbor, all of which have resulted in circumstances and conditions of transportation which have no counterpart at any other port in the country, have necessitated their continuance. As a result, there has been in effect for almost a century an adaptable, flexible, and practical means for collecting, delivering, and interchanging freight without delay or congestion; each carrier serving the port has been on a competitive equality with all others and no one has been permitted to become a dominant factor; and with few exceptions all shippers and receivers of freight and all communities in the port district have been and are now on a rate equality.

The Minority Report

Commissioner McManamy said that "if there ever was a case where we should exercise our discretion to require separate charges it is for this lighterage service, not only at New York but at other north Atlantic ports where those services are performed" He also said that the New Jersey interests had shown that the lighterage, car floatage, and trucking performed by the trunk lines without additional charge costs in excess of $30,000,000 a year and that if a separate charge of only 3 cents per hundred pounds were applied to the tonnage it would increase the revenues of the trunk lines approximately $12,000,000 a year, suggested that "this phase of the case be considered by the co-ordinator in connection with his search for means of conserving carrier revenues."

Impact Tests of Box Cars by A. R. A.

Cars of three designs subjected to impact at relatively high velocities demonstrate ample structural strength—Problem now is protection to lading

AFTER completion of the extensometer and deflectometer tests* to determine deflections and stresses imposed by load conditions in the various structural members of box cars of three designs, the cars were subjected to severe impact tests to determine the effect of collision blows on sills and other structural members. The fundamental objective in this series of tests was the determination of the ability of box cars of the new A.R.A. standard design to withstand abnormally severe punishment resulting from collisions at speeds well beyond those to which the various kinds of lading ordinarily transported in such cars could be expected to escape severe damage or destruction. A further object was a comparison of the performance of this design with two other earlier significant designs typical of modern box-car construction.

The Three Designs Tested

Two cars each of the designs listed below were chosen for test. All were of 50 tons nominal capacity and were equipped with the latest design of "Dreadnaught" corrugated steel ends in order that they might have the benefit of the same degree of superstructure protection under impact.

All cars had an inside length of 40 ft. 6 in. and were equipped with steel corrugated side doors, bottom supported. The same two draft gears, type M-17, with 2 11/16 in. approximate travel, were used in all impact tests. For A.R.A. standard and A.R.A. tentative designs full end loads are delivered through the draft gears to bolster center filling castings. For U.S.R.A. design the end loads are delivered through rear lugs to draft sills and through draft gears to bolster center filling castings.

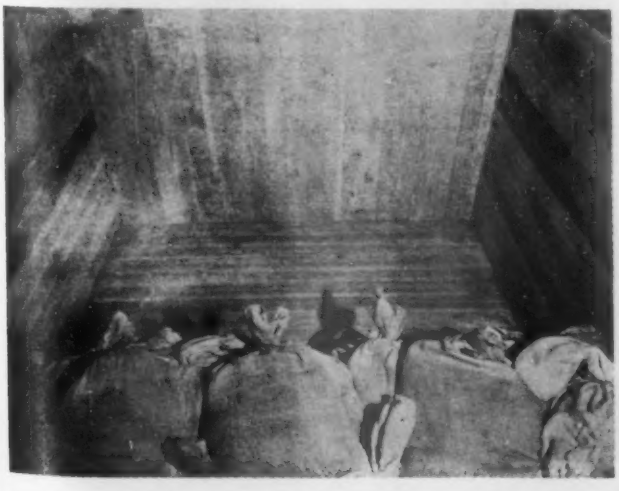
(1) *A.R.A. Standard Design.*†—The two cars, numbered 2 and 4, were built in September, 1933. Their light weights were 44,100 and 44,000 lb., respectively. Couplers were Type E with swivel shank and vertical yoke, single key. Roofs were latest paneled "solid steel" with outside carlines, no vertical rivets.

(2) *A.R.A. Tentative Design.*—The two cars which were owned by the Pennsylvania were numbered 100297 and 100289 and were built in April, 1933. Their light weights were 46,500 and 47,400 lb., respectively. Couplers were Type E with rigid shank and vertical yoke, single key. Roofs were of riveted steel with inside carlines.

(3) *U.S.R.A. Design.*—The two cars which were owned by the New York Central were numbered S-93413 and S-93087 and were built in October and September, 1929. Their light weights were 47,600 lb. in both cases. Couplers were Type D, swivel butt, with horizontal yoke, two keys. Roofs were "solid steel" with outside carlines, no vertical rivets.

* See *Railway Age*, June 23, 1934, page 925, for a summary of the results of these tests.

† See the *Railway Age*, July 9, 1932, page 47, for description and drawings.



Load as Shifted from the Non-Impact End of "A. R. A. Standard" Striking Car Following Maximum Speed of 13 M.P.H.

Load as Shifted Against the Temporary Bulkhead in Impact End of "A. R. A. Standard" Striking Car Following Maximum Speed of 13 M.P.H.

Outline of Tests

Two cars of each design were used in each test, one at rest as the "struck" car and the other in motion as the "striking" car. The tests were made over a half mile stretch of level tangent yard track. Two feet in advance of the struck car, measured from the striking face of the coupler, a stake was driven into the ground adjacent to the running rail. Then, at distances of 52.8 ft. from the first stake and from each other, second and third stakes were similarly located. These stakes were positioned so as to be knocked down when contacting with the front journal box of the striking car. Ten feet beyond the third stake a marker was placed at the side of the track.

The striking car was then coupled ahead of a switching locomotive equipped with a speed indicator. Each

run was started well beyond the marker so that an approximately constant speed could be maintained for some considerable distance before reaching the marker. At this point the speed of the locomotive was retarded, thus permitting the striking car to separate from and move, independently of the locomotive, the remaining distance to the struck car.

At the beginning of each test two or three runs were made at progressively increased speeds with the maximum slightly below that required to close the draft gears on the two cars. This procedure was for the purpose of determining as closely as practicable the draft-gear closing speeds; i.e., the speed at which the first over-solid blows were delivered, and it was soon determined that for the most part the impacts thus could be controlled within a fraction of the desired speed. The actual speed at instant of impact in each case was determined by means of stop-watch readings.

Before each run the coupler knuckles were opened and locks blocked in release position to prevent coupling and so that the blows would be delivered to the faces of the couplers without throwing them out of line. In addition, loosely fitted wooden blocks were inserted on each side between the striking casting walls and the coupler shanks.

Each series of tests was run in two sections, the first being continued under progressively increased speeds until the rapidly developing wedging action of the loads in the struck ends of both cars had caused the corrugated steel ends to bulge outwardly approximately 2½ in. This procedure was followed so that each car body might have full benefit of the structural resiliency under impact which these ends are designed to provide. This characteristic not only assists the end and its fastenings to resist the effects of shifting loads, but also provides a cushion for the surrounding car structure for protection against impact forces met with in service.

The first section included 16 to 18 runs for each car design at speeds ranging from 3 to 10 m.p.h.

At the termination of the first section of each test, the loads were leveled, the protective structures for the impact recorders repaired and restored to original condition and the steel ends were pulled back into normal position. Temporary wooden bulkheads were installed inside the cars at striking ends in order to provide the structural rigidity required to withstand the dynamic forces and wedging pressures of the shifting loads at the higher and progressively increased collision speeds.

When the cars were again in readiness to proceed the second portion of each test was started at initial impact speed approximately the same as the maximum reached at the conclusion of the first section of the same test. Thereafter the speeds were gradually increased until definite signs of distortion or failure had developed in the underframes or superstructures or both.

The second section included five to seven runs at speeds ranging from 9 to 15 m.p.h.

Except for restoring the steel ends to normal position and straightening the door posts, wedged outwardly by the impact-recorder protective structures, no repairs of any kind were made to any car before or after any test.

Preparation of Cars for Tests

The exact light weight of each car was first obtained and the difference between this and the total permissible weight on rail—169,000 lb.—was taken as the maximum lading placed in each car. This load was distributed uniformly over the floor in the form of bags of sand, each weighing 100 lb., together with bags of sawdust weighing somewhat less, so as to increase the depth of the lading which ranged from 3 ft. 7 in. to 3 feet 8½ inches.

One-half of each car body structure toward the striking end was given a coating of cement, including sides, end, center sill and underframe members and riveted joints, so that the development of strains or distortions as the tests progressed would immediately be disclosed.

For the purpose of measuring draft-gear travel, the approximate point at which each gear first closed solid and upsetting or shortening of couplers and connections, indicating apparatus was installed in each striking end. In addition, the face of each striking casting was chalked so that visible evidence of coupler horn contact therewith would be produced.

During the past few years impact registering machines have been quite extensively used by freight-claim departments of various roads and although it was realized that readings in proportion to the damaging shocks delivered to the cars not always would be registered thereby, it was decided to obtain and record such readings during the progress of the tests. Accordingly, two types of impact registers: namely, "Savage" and "Stout," were positioned and securely anchored to the floor of each car at the center of the door opening. The limit of the Stout register is 9 m.p.h. and of the Savage register, 14 m.p.h. When these speeds were exceeded the registers were removed.

In efforts to protect these devices against contact with shifting lading, substantial channel-shaped corrugated-steel housings were placed over each machine and heavy continuous timbers measuring 8 in. by 10 in. were positioned laterally on each side of the housings. The ends of these timbers overlapped the door posts, but were not attached thereto. Shorter heavy wooden beams were fitted longitudinally within the housings so as to provide added stiffening against collapse in this direction. Bags of sand forming a part of the lading were then packed around and over this protective structure.

Impacts of 5 m.p.h. or greater, as registered by these machines, are regarded by the General Manager's Association as bad instances of rough handling with respect to lading protection, and such cases are investigated wherever possible.

Comparative Performance of the Three Designs

Although approximately the same number of runs were made with each design during the regular tests

Condition of Protective Housing for Recorder and Blocking at Door Opening of U. S. R. A. Striking Car After Tests at Maximum Speed of 10.25 M.P.H.

average impact speed for the A.R.A. standard cars was the lowest, being 7.33 m.p.h. as compared with 8.26 and 7.96 for the U.S.R.A. and tentative A.R.A. cars, respectively. Therefore, in the following summary of the performance and condition of the A.R.A. cars, the effects of runs 24 and 25 of the extra high-speed tests, made only with the A.R.A. cars, have been included. The resulting average impact speeds and kinetic energy imputs are then as follows:

Car design	No. of runs	Impact speed, m.p.h. Max.	Impact speed, m.p.h. Avg.	Total kinetic energy absorbed
A.R.A. standard	25	16.10	7.93	9,674,512
U.S.R.A.	24	15.00	8.26	10,037,762
Tentative A.R.A.	22	14.30	7.96	8,768,698

The steel ends with which all three designs were equipped functioned in accordance with previously established design requirements and no failures occurred either in the ends themselves or the superstructure attachments.

Due to abnormal punishment considerable damage was done to the door posts of all three designs from the wedging action of impact recorder steel housing and protective timbers.

A.R.A. Standard Cars.—After the first test both cars were in their original condition and all rivets were tight.

During the second test only normal deflection of side posts and sheathing plates under the severe wedging action of the loads had taken place and no distortion whatever had developed in the side plates or sills, end sills, underframe parts, center-sill members or roofs. All rivets in bolster center fillers, body center plates and throughout the car bodies were tight. Except for the front faces of bolster center filling castings which had become slightly indented due to contact with the rear ends of the draft gears, these cars had absorbed the punishment to which they had been subjected without change from their original condition.

U.S.R.A. Cars.—As a result of the first test the side posts and sheathing plates had become slightly bulged due to the wedging of the loads. The side plates and sills, end sills, underframe parts, center-sill members and roofs remained in normal condition. All rivets in cheek plates and body center plates were tight, but a number of rivets had loosened in the bolster center filler castings. One cheek-plate casting in the striking car had cracked through a rivet boss.

During the second test bulging of side posts and sheathing plates had progressed somewhat further. The side sills and side plates had buckled approximately ⅜ in. at the door openings. End sills, underframe parts, center-sill members and roofs showed no apparent damage. Two additional bolster center filler rivets on one car and one on the other had loosened and cheek plates on the two cars had developed further cracks. Both car structures had begun to show definite evidence of distress at the conclusion of the second test.

Tentative A.R.A. Cars.—After the first test the side posts and sheathing plates were bulged outwardly to some extent from the action of the wedging loads. Side plates and sills, end sills, underframe parts, center-sill members and roofs were still in good condition. A number of rivets had loosened in the front lugs, bolster center filler castings and truck center plates. Loose rivets were also present in the body center plates of the striking car, but those in the struck car remained tight. Buffing faces of the bolster center filler, striking car, had become slightly indented.

After the second test the bulged condition of side posts and sheathing plates had progressed outwardly somewhat more than was found in the U.S.R.A. cars and this applied also to the corner posts. The side sills and side plates had buckled at the door opening about ⅜ in. The end sills were bowed inwardly ⅜ in. at the colliding ends, indicating movement between center sills and side structure. Underframe parts and center-sill members were not damaged. Roof sheets at door opening of struck car had begun to bulge upwardly at the sides.

A few additional loosened rivets were found in the bolster center filler castings, also one each in the truck center plates at the colliding ends. This applies also to two body center plate rivets in the striking car. A tendency for the bolster center filler castings to shift had developed. Under the last impact made at 14.3 m.p.h. both cars were knocked off the center plates at the non-striking ends, which resulted in some damage to related parts. Both car structures were in distress at the conclusion of the second test.

Conclusions from Regular Tests

(a) Under all normal operating and service conditions, including switching operations, cars of all three designs tested are capable of giving satisfactory performance.

(b) Although a different design, cross-sectional area and weight of center-sill member is used in each of the three designs, any one of them may be relied upon to survive disintegration of the respective superstructures and related underframe constructions under collision conditions leading to destruction of the cars.

(c) Due to design and application the bolster center filler casting of the A.R.A. standard car may be expected to remain tight and in proper position and to give better service than may be expected of either of the other two designs.

(d) Experience gained through the action of the heavy corrugated steel housing and timber blocking installed at the door openings of all three designs to protect the impact recorders indicates quite definitely that at switching speeds having upper limits of 5 to 6 m.p.h., lading ordinarily handled in box cars is subject to severe damage and may not be expected to survive destruction at the higher speeds under which steel-sheathed car structures of reasonably good design begin to show signs of failure.

(e) Considering the performance of each unit of equipment as a whole, the A.R.A. standard cars demonstrated their capacity to absorb abnormal collision punishment under full axle load without damage of consequence, whereas both the U.S.R.A. and tentative A.R.A. car-body structures showed unmistakable evidence of approaching failure.

(f) Punishment received by the A.R.A. standard cars during this series of impact tests was not sufficient to provide further check on the necessity for making changes in design as reported in the extensometer and deflectometer test report, but such evidence was developed from succeeding tests of these cars.

Performance of A.R.A. Standard Design under Extra High Speed Impact

Four runs were made at average impact speed of 16.21 m.p.h. and maximum of 18.30 m.p.h. Total kinetic energy absorbed was 5,641,500 ft. lb.

Definite distortion leading to failure first developed in the side plates and side sills at the door opening as a result of the side truss buckling and shear action. Moderate bulging of side posts and sheathing plates resulted from wedging action of the lading. End sills were bowed inwardly at the striking ends and outwardly at the opposite ends, indicating horizontal deflection of

bolsters with resulting small relative movement between the center sills and the side structures. Floor support and cross-bearer diaphragms had bowed correspondingly and the bottom cover plates of the latter were kinked downwardly between the center-sill members due to the superstructure buckling effects. No indications of distortion or failure were present in the center sills. The roofs were undamaged other than having become bent at the door openings in conformity with side-plate distortion.

Conclusions.—Although the action of the car body as a unit had demonstrated the desired degree of design efficiency resulting from uniform distribution of material throughout the structure, it was plainly shown that when collision punishment is carried to the point at which actual destruction begins, the superstructure may be expected to fail before the underframe cross members become distorted to any extent and that the integral center sill would be the last important member to become defective.

Performance when Coupled at Head End of String of Cars

In the final runs one A.R.A. standard car was coupled at the head of a string of six additional empty box cars on which hand brakes were not set up. The load in this car was reduced to one half, resulting in 108,500 lb. at the rail. The striking car retained its full load.

This test consisted of ten runs at average impact speed of 10.1 m.p.h. and maximum of 14.2 m.p.h.

The cars had been turned end for end and the wedging load caused some bulging of side posts and sheathing plates. Under this reversed end loading the side sills, side plates and end sills immediately began to straighten up, but somewhat more rapidly in the struck car than in the striking car. At the conclusion of the test both car superstructures and end sills had lost practically all distortion with no bad effects, and this applied also to the underframe cross members, except for the kinks in the cross-bearer bottom cover plates. The roofs had straightened up and were undamaged. Striking castings had not been damaged.

A number of slightly loosened rivets were found in the bolster center filler castings; also in the body center plates and diagonal braces where they had loosened up considerably. Some of these defects probably had developed during the immediately preceding high-speed runs. On the struck car the contact faces of bolster center filler at B end had not changed, but at the A or struck end indentations on the left-hand face had increased in depth from 1/8 in. to 3/16 in., while the right-hand face remained the same.

Tight Rivets Important

Because of extreme progressive hammering received by the bolster filler castings, which finally caused only slight loosening of a small portion of the attachment rivets during the concluding collision tests, it is considered unnecessary and inadvisable to attempt alteration of the design in efforts to guard against development of relatively slight contact face indentations. Preservation of tight rivets is of much greater importance.

Check of the center sill on struck car, which had been squeezed at the head of the string, shows only small horizontal and vertical variations from the straight-line base.

Both cars benefited from the reversal of impact loading and, as a result, required less reconditioning than would have been necessary if the final test had not been made.

Conclusions.—The integral Z-bar center sill of the standard box car is capable of withstanding as a column under dynamic loading, without distortion or failure, a degree of collision punishment which first would cause failure in the superstructure of the car. Further, it is capable of withstanding, without damage, impact blows of sufficient intensity to cause loosening of bolster center filler attachment rivets even though the design of this casting, together with arrangement and utilization of rivets therein, is superior to either of those embodied in the U.S.R.A. or the tentative A.R.A. underframe constructions.

Changes in Design

Collision performance results under high-speed impacts provided further check on the desirability of making the following changes which now have been incorporated in the drawings:

(1) Increase in width of bolster top and bottom cover plates so as to reduce or eliminate the possibility of horizontal deflection in those members under heavy impacts.

(2) Application of pressed pan shape fillers between center-sill members in line with cross-bearer diaphragms.

The character of the impact test loading was not such as to develop further check on design changes given below, which, however, are now included in the drawings as the result of knowledge gained during tests. These changes were made to improve stress and deflection conditions under vertical dynamic loads instead of end loads.

(3) Extension of top rear portion of the bolster center filler casting.

(4) Substitution of a suitable bulb-angle reinforcement under the door opening in place of the original channel member.

Roosevelt Shows Great Enthusiasm for Waterways

PRESIDENT ROOSEVELT in his progress through the Northwest during the past week has made several references to his continued advocacy of the development of inland waterways to compete with the railroads in that and other sections. He expects to spend the taxpayers' money, he said, to provide for navigation of ocean vessels as far inland as The Dalles, Ore., and to push barge transportation beyond that "right up into the wheat country." Work on the St. Lawrence project, he promised, "is going to be started"—supposedly indicating his intention once more to urge upon the Senate the ratification of the treaty with Canada providing for joint action of the governments of the two countries in this development.

He also looks upon the development of river transportation as a provider of employment, not only upon construction work, but in actual transportation upon the improved waterways, to wit, on the nine-foot channel in the Missouri for which the Fort Peck reservoir is supposed to assure an adequate flow of water. No mention was made of any offsetting factor of unemployment on the railroads which would result if the river projects should prove successful and thus divert traffic from them. At Bonneville, Ore., on August 3, the President spoke in part as follows:

Ocean Vessels as Far as The Dalles

"It has been my conception and my dream that while most of us are alive we would see sea-going vessels

come up the Columbia river as far as The Dalles. It was only this morning that the Secretary of War told me of a new survey that is being made by the Army engineers. From that survey we hope that it will be found to be wisdom to enlarge these locks over here so that ocean-going ships can pass up as far as The Dalles, and I hope that we can enlarge the navigational needs from The Dalles up so that we can have barge transportation right up into the wheat country.

"I am reminded a good deal of another river with a problem somewhat similar—a river on which I was born and brought up, but that was only a comparatively few years ago. Within the past ten years through the action of the federal government, the channel of the Hudson river was so deepened that Albany, 140 miles from the sea, was made a sea-going port. You have a very similar case on the Columbia. In the same way in the State of New York, above Albany you met the rapids and the falls of the Mohawk.

"It was over 100 years ago that De Witt Clinton, a governor of New York, built what was called Clinton's Ditch, the entire canal, and carried navigation by barge through from the sea to the Great Lakes. And so I believe that the day will come on the Columbia when we will not only extend seagoing navigation far back in to the continent, but by seagoing navigation we will be able to extend barge navigation still further back north into the State of Washington and far east in the State of Idaho."

Jobs for River Transport Employees

At the site of the Fort Peck dam on the Upper Missouri on August 7 his remarks included the following:

"It [the Fort Peck Dam] is going to be, when it is completed, the largest earthwork dam in the world. I believe also that in its construction they are going to do a very great amount of good for the elimination of unemployment—that means unemployment today and unemployment in the future.

"In so far as unemployment today goes, that type of dam probably uses more man power, more hours of work in its completion than concrete dams or other types. It is also true, of course, that a very large portion of the materials that go into this dam come from other parts of the Union—some of them from Pittsburgh and New York City, and from Birmingham, Ala., and as far west as the Pacific coast, but there is the other feature about unemployment—employment in the days to come.

"I refer to the fact that when this dam is completed it is going to be an important factor in the navigation of the Missouri river. It is going to help to maintain the nine-foot channel which would connect up with the Mississippi and enable the wheat growers and farmers of the Northwest to get cheaper transportation rates to the middle country and foreign countries."

Indexes to Volume 96

THE INDEXES to the latest volume of the *Railway Age*, January to June, 1934, are now ready for distribution and copies may be had by those subscribers desiring them. Requests should be addressed to the Circulation Department, *Railway Age*, 30 Church street, New York. Subscribers who have in previous years made application for the index need not apply again; they will continue to receive it as long as they continue to subscribe.

Odds and Ends . . .

Llanfairpwligw—Etc.

At last, after intensive efforts, this department is enabled to present, through the courtesy of the Pullman News, a reproduction of the London, Midland & Scottish station sign in Wales

One Gargles This Station Name

that so far exceeds all other station signs in length as to romp home to a world's record. Leather-lunged American train callers might practice on this one for a while.

Curiosity Kills the Cat

Mo, a black alley cat which had spent its entire three years among the third rails and fast freight trains in the Mott Haven yards of the New York Central and which has made considerable journeys as a stowaway on N. Y. C. locomotives, permitted its curiosity to get the better of it the other day. With his nose in the air he deserted the comparative safety of the railway yard and ventured forth into a nearby street where highway competition was too much for him. After he had been struck by a hit-and-run driver and killed, Mo's body was brought sorrowfully back to his home in the railway yard, and he now rests, with honors, beneath the signal tower.

Biggest Timetable

Word comes to us from England of the gargantuan new Great Western timetable. It comprises 312 pages, with more than six million figures. The paper for printing, if stretched out, would form a 30-in. wide strip from Paddington to Penzance, which for the benefit of those unfamiliar with English geography, is a considerable distance. The type and stereos used in printing it weigh more than four tons. No wonder English railways charge for timetables.

Free Railways

There are at least two, and possibly more, free railways in the world. One, previously reported by this department, is at Viti Levu in the Fiji Islands. The other is operated from Grimsbargh on the main line of the L. M. S. (England) to Whittingham Asylum, three miles. Strangely, the train operated on the L. M. S. consists of the usual English first and third classes and, although no fare is charged and there is no conductor present, the free riding passengers never seem to have any doubts as to whether they are first or third class passengers.

Crooks—Avoid the D. & H.

In a recent national shooting meet, J. H. Overbaugh, of the Delaware & Hudson police, won the rapid-fire pistol championship at 25 yd. with the record score of 193. Leo Gratcofsky, also of the D. & H. police, added to that outfit's laurels by winning the time-fired pistol championship at the same distance with the same score, 193, which was not, however, a record in this event.

NEWS

Net Shows Increase for Six Months But Decrease for June

Class I railroads for the first six months of 1934 had a net railway operating income of $225,803,916, which was at the annual rate of return of 2.09 per cent on their property investment, according to reports compiled by the Bureau of Railway Economics. In the first six months of 1933, their net railway operating income was $154,728,928, or 1.42 per cent.

Operating revenues for the first six months of 1934 totaled $1,629,897,100 compared with $1,415,322,703 for the same period in 1933, an increase of 15.2 per cent. Operating expenses for six months amounted to $1,212,287,063 compared with $1,069,051,006 for the same period in 1933, an increase of 13.4 per cent. Class I railroads in the first six months of 1934 paid $127,814,868 in taxes compared with $131,778,039 for the same period in 1933, a decrease of 3.0 per cent. For the month of June alone, the tax bill amounted to $21,367,887, a decrease of $1,365,595 under June 1933.

Thirty-three Class I railroads failed to earn expenses and taxes in the first six months of 1934, of which 8 were in the eastern district, 6 in the southern and 19 in the western.

Class I railroads for June had a net of $41,836,301, or at the rate of 1.99 per cent. In June, 1933, their net was $59,831,293, or 2.83 per cent. Operating revenues month of June amounted to $282,779,492, compared with $278,329,369 in June, 1933, an increase of 1.6 per cent. Operating expenses in June totaled $208,313,248 compared with $185,342,623 in the same month in 1933, an increase of 12.4 per cent.

Class I railroads in the eastern district for six months had a net of $147,727,468, at the rate of 2.69 per cent. For the same period in 1933, their net was $107,107,564, or 1.94 per cent. Operating revenues in the eastern district for six months totaled $856,251,110, an increase of 18.3 per cent, while operating expenses totaled $612,127,392, an increase of 16.9 per cent. Class I railroads in the eastern district for June had a net of $26,067,189, compared with $33,324,022 in June, 1933.

Class I railroads in the southern district for six months had a net of $31,784,478, at the rate of 2 per cent. For the same period in 1933, their net amounted to $26,048,280, at the rate of 1.61 per cent. Operating revenues in the southern district for six months amounted to $211,498,686, an increase of 11.1 per cent above the same period in 1933, while operating expenses totaled $157,722,607, an increase of 10.8 per cent. Class I railroads in the southern district for June had a net of $2,670,301, compared with $6,651,980 in June of 1933.

Class I railroads in the western district for six months had a net of $46,291,970, at the rate of 1.24 per cent. For the same six months in 1933, they had a net of $21,573,084, at the rate of 0.57 per cent. Operating revenues in the western district for six months amounted to $562,147,304, an increase of 12.1 per cent, while operating expenses totaled $442,437,064, an increase of 9.8 per cent. For June alone, the railroads in the western district reported a net of $13,098,811. The same roads in June, 1933, had a net of $19,855,291.

CLASS I RAILROADS—UNITED STATES

	1934	1933	Per Cent Increase
Month of June			
Total operating revenues	$282,779,492	$278,329,369	1.6
Total operating expenses	208,313,248	185,342,623	12.4
Taxes	21,367,887	22,733,482	*d* 6.0
Net railway operating income	41,836,301	59,831,293	*d*30.1
Operating ratio—per cent	73.67	66.59	—
Rate of return on property investment	1.99%	2.83%	—
Six months ended June 30			
Total operating revenues	$1,629,897,100	$1,415,322,703	15.2
Total operating expenses	1,212,287,063	1,069,051,006	13.4
Taxes	127,814,868	131,778,039	*d* 3.0
Net railway operating income	225,803,916	154,728,928	45.9
Operating ratio—per cent	74.38	75.53	—
Rate of return on property investment	2.09%	1.42%	—

d—Decrease.

New Jersey Class Rates Found Not Discriminatory

Intrastate class rates in New Jersey prescribed by state authority were found not to cause unjust discrimination against interstate commerce nor undue prejudice and preference, except rates so prescribed between Camden, N. J., and points in New Jersey beyond 80 miles, including points in the New York group, in a decision made public by the Interstate Commerce Commission on August 2. The decision was rendered following an investigation on a petition filed by the railroads after the state Board of Public Utility Commissioners had suspended the intrastate rates filed by the carriers to accord with the general readjustment of class rates in official territory which the I. C. C. had prescribed effective December 3, 1931, and had prescribed a basis of state rates differing from the interstate rates in grouping. The I. C. C. found that the rates to and from Camden were unduly prejudicial to Philadelphia, Pa., and prescribed rates not lower than those to and from Philadelphia.

The Canadian Roads in June

The Canadian National had an increase in net operating revenue of $2,398 in June, when compared with June of last year. For the first six months of this year the increase was $7,357,523.

Operating revenues for the system in June were $13,915,447, an increase of $389,425, while operating expenses increased $387,027.

In the six months, net revenue totaled $4,378,541, as compared with a net operating deficit of $2,978,981 in the same period of last year, an increase of $7,357,523. Operating revenues for the six months' period increased by $12,021,876, while the increase in operating expenses over the 1933 period was $4,664,353.

Figures for June and the six months' period, with comparisons, follow:

	1934	1933	Inc.
JUNE			
Op. rev.	$13,915,447	$13,526,022	$389,425
Op. exp.	12,927,154	12,540,126	387,027
Net op. rev.	988,293	985,896	2,398
SIX MONTHS TO JUNE 30			
Op. rev.	$79,496,747	$67,474,871	$12,021,876
Op. exp.	75,118,206	70,453,852	4,664,353
Net op. rev.	4,378,541	*2,978,981	7,357,523

* Deficit.

Net operating revenue of the Canadian Pacific in June totaled $1,755,579 as compared with $2,049,387 in June of last year, representing a decrease of $293,807. Gross for the month at $10,009,263 showed a decrease of $430,367, while operating expenses at $8,253,684 were $136,559 below those for June of last year.

For the first six months of 1934, net operating revenue totaled $8,054,412, which compares with $4,861,140 in the first half of 1933, an increase of $3,193,271 or over 65 per cent. Gross for the six-month period at $57,210,680 showed an increase of $6,487,185 over the same period of last year, while operating expenses at $49,156,268 recorded an increase of $3,293,914.

Jersey Central Extends Air Conditioning

Seven completely air-conditioned trains are now making the daily run between New York and Philadelphia on the Reading-Jersey Central, according to an announcement by the latter company. The trains are equipped complete—coaches included—and the apparatus employed not only cools the air, but regulates its humidity and removes impurities as well.

The trains so equipped are those leaving New York at 10 a.m., 4 p.m., 5 and 6, and those leaving Philadelphia at 7:00 a.m., 8:00 and 2:00 p.m. (daylight saving time). In addition, the other trains have been partly air-conditioned.

Low-Rate C. and D. Service Extended in South Jersey

Extension of collection and delivery service for merchandise freight to cover shipments between Philadelphia, Pa., Camden, N. J., and the Atlantic City-Ocean City territory of the Pennsylvania-Reading Seashore lines has been announced by the two companies to take effect August 20. The communities embraced in the enlarged scope of the truck pick-up and delivery service are: Bridgeton, N. J., Cape May, Egg Harbor, Glassboro, Hammonton, Millville, Paulsboro, Penns Grove, Pleasantville, Salem, Vineland and Wildwood. When this service for less than carload freight shipments was inaugurated in June, 1932, it applied only between Philadelphia and Camden, and Atlantic City and Ocean City.

According to the tariffs filed with the Interstate Commerce Commission, the new scale of rates in this enlarged territory for the complete door to door service, will be considerably lower than those now prevailing.

The rate per 100 lb. of 30 cents to Atlantic City and 31 cents to Ocean City, including the collection and delivery service, will remain as originally established. Other points to which the all-commodity 30-cent rate will apply are Egg Harbor, Glassboro, Hammonton and Pleasantville. Cape May and Wildwood will have a rate of 35 cents, while a 31-cent rate will govern between Philadelphia-Camden and Bridgeton, Millville, Paulsboro, Penns Grove, Salem and Vineland.

No distinction is made between the types of commodities handled, and with but a few exceptions, the one flat rate per hundred pounds will apply for all goods shipped by truck pickup and delivery. Over-night deliveries are assured in both directions for these shipments handled under these tariffs.

Motor Manufacturers Grieve at "Tax" Burden

"A check for the fantastic sum of $1,137,872,000 would have to have been written if highway users of the United States had elected to pay all of their 1933 motor vehicle taxes collectively in a single transaction"—thus reads the publicity statement of the National Automobile Chamber of Commerce issued in connection with its interesting annual pamphlet of statistics, "Automobile Facts and Figures."

Further down in the statement, however, it is disclosed that expenditures on rural highways alone during the year (exclusive of city streets) totaled $1,300,000,000. Automotive "taxes" apparently, therefore, were not even sufficient by some hundreds of millions to meet the cost of special facilities provided for automotive transportation, to say nothing of making any contribution whatever toward the general expenses of government—which the term taxes is ordinarily taken to mean.

The pamphlet contains much valuable statistical information — unfortunately so interlarded with propaganda that the layman may find it difficult to separate the worth-while data from that which is misleading. A curve of industrial production is shown, for instance, compared with another on railroad freight traffic in which the latter is made to appear consistently in excess of the former ever since the turn of the century—whereas it is known to impartial students that any fair index of railroad traffic compared with one on industrial production would show, in every year since 1927, a definite decline of the former to a point well under the latter.

Eddy on Retirement Board

Lee M. Eddy, whose appointment as a member of the Railroad Retirement Board was announced in the *Railway Age* of July 28, page 127, has been vice-president of the Order of Railroad Telegraphers since 1919 and has been chairman of the pension committee of the Railway Labor Executives' Association. He was born in Michigan in 1881 and became a telegraph operator on the Grand Trunk at the age of 22. He became interested in union activities and for five years was located in the O. R. T. headquarters at San Francisco. For three years he had headquarters in New York and since 1927 he has been with the headquarters of the grand division of the O. R. T. at St. Louis.

Lee M. Eddy

International Air Express

The first through international shipment of air express for the West Indies, Mexico, and Central and South America under the new system formed by the co-ordination of the express shipping facilities of the American trunk line railways and the Pan American Airways System left Washington on August 7 on a special airliner which left Seattle the day before, picking up shipments from 29 states destined to Latin American countries. At the airport when the special plane arrived was 200 pounds of cargo originating in Washington. This was put aboard the plane which took off at 11.15 a. m. en route for Miami where it will connect with the International lines of Pan American Airways. The shipments leaving Washington were to be delivered by the new service to Buenos Aires, the most distant capital of Latin America, within 8 days, and to the most distant countries in the West Indies and Central America within 3 days. Through the elimination of complex formalities formerly required for international shipping the new international-express service will speed up shipments of American exports from three to thirty times.

Recommends Dismissal of Complaint Against B. & M. Store-Door Service

In a proposed report made public on August 4 Examiner Leo F. Flynn of the Interstate Commerce Commission has recommended that the commission dismiss a complaint filed by the Motor Truck Club of Massachusetts, Inc., against the Boston & Maine alleging that the rates and charges maintained by the B. & M. for store-door service performed under contracts with private trucking interests or through its subsidiary, the Boston & Maine Transportation Company, are in violation of the interstate commerce act.

"Defendant's store-door service is still in an experimental stage," the report says. "As it has gained experience since the inauguration of its store-door service, it has repeatedly changed its tariffs and charges. It should be permitted and encouraged to continue the experiment in the absence of a clear showing that there is some violation of the act involved, and this the record fails to do." The investment of the Boston & Maine's funds in the stock of the Transportation Company, Mr. Flynn says, and advances made to the Transportation Company by it to cover deficits are not unlawful and there is no violation of the act if such transactions are accounted for in compliance with the commission's accounting regulations, and there is no suggestion in the record that this is not the case. He added that complainant had made general reference to the fact that the railroad had secured loans from the government, but that the record does not disclose the amount of these loans or the purpose for which they were secured.

New Minister of Transport in Great Britain

Leslie Hore-Belisha has recently been appointed minister of transport in Great Britain to succeed Oliver Stanley who has been transferred to the ministry of labor. Mr. Hore-Belisha, a lawyer, has been financial secretary to the treasury since 1932, having previously served for a year as Parliamentary secretary to the Board of Trade. He is the third member of the present national government to hold the office of minister of transport, the first being Sir Percy J. Pybus who was succeeded by Mr. Stanley early in 1933.

Rolfe on Adjustment Board

M. F. Rolfe, whose appointment as a representative of Eastern railroads on Division 1 of the National Railroad Adjustment Board, as announced in the *Railway Age* of August 4, page 150, as born in April, 1884, at South Casco, Me. He entered the service of the Maine Central in September, 1901, as clerk in the office of the auditor of freight accounts, being appointed traveling inspector, supervising and checking station accounts, in June, 1907. From December, 1908, to April, 1909, Mr. Rolfe was out of railroad service. On the latter date he returned to the Maine Central as traveling inspector and traveling auditor, supervising and checking station accounts, and in November, 1913, he was put in charge of a crew preparing special traffic statistics for the second vice-presi-

dent. In May, 1914, he was appointed traveling auditor and in January, 1916, he became statistician in the office of the general manager, being employed principally in the preparation of statistics on wage schedules and labor matters. From July, 1917, to the present time Mr. Rolfe has served consecutively as chief clerk to general manager, chief clerk to federal manager, chief clerk to vice-president and general manager, assistant to vice-president and general manager, and assistant to general manager of the Maine Central and the Portland Terminal.

Court Sets Value on Los Angeles Terminal Ground

The land owned by the Southern Pacific at the site of the proposed union terminal in Los Angeles was given a value of $1,207,069 by a court at Los Angeles on August 4. Witnesses for the Atchison, Topeka & Santa Fe and the Union Pacific, plaintiffs in the suit, estimated the value of the property at from $1,000,000 to $1,324,150, as compared with the Southern Pacific's estimate of between $3,473,676 and $4,000,000. In the suit, the Union Pacific and the Santa Fe sought the determination of the value to establish their interest in the property under the State Railroad Commission ruling which held that the Union Pacific should bear 23 per cent of the cost of the condemnation price, the Santa Fe, 33 per cent, and the Southern Pacific, 44 per cent.

Freight Commodity Statistics

The total tonnage of revenue freight carried by Class I railways in the first quarter of 1934 was 342,460,987, according to the Interstate Commerce Commission's quarterly statistical statement. The total tonnage originated was 186,649,941 tons, an increase of 47,760,341 tons as compared with the corresponding quarter of 1933. All groups of commodities participated in the increase, as follows:

	Number of tons 1934	1933	Increase 1934 over 1933
Products of agriculture	17,141,607	15,214,011	1,927,596
Animals and products	4,232,562	3,906,339	326,223
Products of mines	110,837,201	82,716,864	28,120,337
Products of forests	8,820,105	5,598,975	3,221,130
Manufactures and miscellaneous	42,171,081	28,480,461	13,690,620
All L.C.L. freight	3,447,385	2,972,950	474,435
Total	186,649,941	138,889,600	47,760,341

I. C. Makes Pension Arrangements

The Illinois Central, pending the constitutionality of the recently enacted legislation governing railroad pensions, has placed the following temporary arrangements in effect: Pensions authorized prior to August 1, 1934, will continue to be paid under the previously existing system. No new pensions under that system will be authorized, but for the time being employees will not be retired on account of reaching the age limit. Employees retired due to physical or mental incapacity will be paid allowances based on the previous system, but with the new national law figures as a maximum.

For the time being the railroad is not making any deductions from employees' pay, as called for in the law, except in the case of employees leaving the service.

Pennsylvania Broadens Air-Conditioned Service

Additional air-conditioned cars were placed in service by the Pennsylvania on August 1 and 2 in regular trains running in both directions between Chicago and Cincinnati, Dayton, Columbus, Springfield, Indianapolis and Louisville. From Chicago to Cincinnati an air-conditioned car will be included in the regular equipment of the Cincinnati Night Express, while on the return trip the air-conditioned car will be carried by the Southland. The latter train will also have air-conditioned cars in both directions between Chicago, Dayton and Springfield.

Between Chicago and Columbus the two air-conditioned cars will be carried eastbound in the Atlantic Express and westbound in the Chicago Night Express. The Louisville Night Express from Chicago to Louisville will have two air-conditioned cars for the latter destination and also an air-conditioned car for Indianapolis, while northbound the cars will be operated on the Chicago Night Express.

System Board of Adjustment Formed on Long Island

Formation of a System Board of Adjustment for the settlement of differences arising between the management of the Long Island and its employees in engine and train service, under the recent amendments to the Railway Labor Act, was announced on August 2 by George Le Boutillier, vice president. The new railway labor tribunal will be known as "Long Island Railroad Engine and Train Service System Board of Adjustment." Its authority will be final in the settlement of controversial matters which for any reason cannot be disposed of by negotiation locally between the railroad's divisional and general officers, and representatives of the men.

The Board will be composed of eight members, four to be selected by the management and a like number by the engine and train service employees. Employees and management will have equal voting power and to reach a decision, not less than a two-thirds vote will be necessary.

Railroad Credit Corporation Has Returned 23 Per Cent

The Railroad Credit Corporation has returned, through liquidating distributions and tax refunds, $18,689,152 of the emergency freight revenues collected by the participating carriers through March 31, 1933, and pooled under their marshalling and distributing plan, according to the July report filed with the Interstate Commerce Commission.

In a letter accompanying the report E. G. Buckland, president of the corporation, said that cash receipts during July aggregated $272,725, including payments of $234,223 in reduction of loans. In compliance with the provisions of the plan, surplus funds are promptly distributed, and a ninth distribution, amounting to $726,502, was made July 31, of which $339,357 was paid in cash, and $387,145 in credits. The aggregate of the nine liquidating distributions made to date amounts to 23 per cent of the pooled fund, or $16,961,370, of which $7,353,891 has been paid in cash, and $9,607,479 credited on obligations due the corporation.

Detroit Enacts Ordinance to Prohibit Ticket Scalping

Detroit has recently enacted an ordinance to prevent the unauthorized buying or selling of tickets issued by railroad or steamship companies or certified bus lines. Any persons violating any of the provisions of this ordinance shall upon conviction, for each offense, be fined not less than $10 and not exceeding $500, and /or imprisoned in the Detroit house of correction for not exceeding 10 days. Similar ordinances have been enacted by Youngstown, Ohio, and Lockport, N. Y.

Detroit has also enacted an ordinance to regulate the licensing of persons engaged in the business of procuring and arranging for the transportation of persons by motor vehicle for hire. Under the ordinance, a motor carrier transportation agent, travel bureau, travel bureau agency, or share-expense tour agency must secure a license to operate, and failure to do so is punishable by fine of not more than $500 or confinement in the house of correction for not more than 90 days, or both.

New Fast Freight Service Between Chicago and Twin Cities

An overnight freight service between Chicago and the Twin Cities which reduces the running time to 11 hours, or about 8 hours less than previous schedules, and the delivery of merchandise approximately a day, was established by the Chicago & North Western, the Chicago, Burlington & Quincy and the Chicago, Milwaukee, St. Paul & Pacific on August six. Merchandise delivered to the railroads late in the afternoon is in the hands of the consignee early the following morning.

Freight is accepted at Chicago by the North Western as late as 5:30 p. m. and is available for delivery at St. Paul and Minneapolis at 7 a. m. the following morning, with approximately the same schedule in the opposite direction.

Short Lines Attack Pension Act

The validity and constitutionality of the Railroad Pension Act was attacked by the American Short Line Railroad Association at its Twentieth Annual meeting at Milwaukee, Wis., on August 6 and 7, when it passed a motion that individual lines at their own volition join forces with other agencies attacking the constitutionality of the act. Exemption from the Railway Labor Act is also being sought by the Association because "the bill will create strife on the short lines where none now exists" and because "none of the alleged evils which the bill seeks to correct exist on the short lines". System boards of adjustment to settle labor disputes rather than short line membership representation on the National Board of Adjustment were recommended.

Officers of the association, W. L. White, president, R. E. Schindler, secretary-treasurer, and C. A. Miller, general counsel, were re-elected.

Equipment and Supplies

LOCOMOTIVES

THE SEABOARD AIR LINE has given a conditional order to the Baldwin Locomotive Works for five Mallet 2-6-6-4 type locomotives. Inquiry for this equipment was reported in the *Railway Age* of March 31.

THE ILLINOIS CENTRAL, reported in the *Railway Age* of June 23 as having been allotted funds by the P. W. A. for 11 Diesel locomotives for use in switching service, is now inquiring for this equipment.

FREIGHT CARS

THE UNITED FRUIT COMPANY is inquiring for 500 automatic couplers and draft gears for service on the Santa Marta Railway, Colombia, South America.

THE SEABOARD AIR LINE has ordered 100 phosphate cars of 70 tons' capacity from the Pullman Car & Manufacturing Corporation. Inquiry for this equipment was reported in the *Railway Age* of July 14.

PASSENGER CARS

THE GULF, MOBILE & NORTHERN has placed an order with the American Car & Foundry Company for two light-weight, streamlined trains of three cars each, and an extra streamlined coach. These cars, seven in all, are to be fully streamlined and of the non-articulated type. A light-weight alloy steel, U. S. S. Cor-Ten, will be used. The entrance and exit will be in the center, rather than at the end as in conventional standard equipment. Closures between the cars will be flush with the outer contours of the cars to obtain the proper streamlined effect. The first car, comprising the power unit, will have a 600 hp. Diesel-electric engine and mail and baggage compartments. The center coach will contain a passenger compartment and a buffet kitchen, from which meals will be served throughout the train. The third car will be a sleeper-observation car, providing a stateroom and six upper and six lower berths. The rear end of this car will be an observation chair compartment. The cars will be completely air-conditioned, and indirect lighting will be featured throughout.

SIGNALING

THE PENNSYLVANIA has ordered from the Union Switch & Signal Company 22 sets of four-indication continuous coded cab signal engine equipment with warning whistle and acknowledger for motor-trailer multiple-unit cars, for operation in the Philadelphia Terminal territory.

THE ERIE has ordered from the Union Switch & Signal Company 60 style "H" searchlight signals, nine position-light signals, with necessary relays, copper oxide rectifiers, etc., for the installation of automatic blocking between Suffern, N. Y., and Ridgewood, N. J., and for rehabilitating the interlocking plant at Waldwick, N. J.

IRON AND STEEL

THE BOARD OF TRANSPORTATION, New York, reported in the *Railway Age* of July 14 as inquiring for about 6,000 tons of track rail and 375 tons of guard rail and miscellaneous spikes, bolts and tie plates, has ordered the rail from the Bethlehem Steel Company.

Supply Trade

M. J. Czarniecki, general manager of sales of the **A. M. Byers Company,** Pittsburgh, Pa., has been elected vice-president in charge of sales, succeeding **H. W. Rinearson,** who has resigned.

The Bucyrus-Erie Company, South Milwaukee, Wis., has appointed the **Crook Company,** Los Angeles, Cal., its distributor in the Southern California territory for the sale of power shovels, draglines, cranes, clamshells and skimmer-scoops. **The Burgman Tractor-Equipment Company,** Jacksonville, Fla., has been appointed distributor for this company's excavating equipment in the northern part of Florida.

Robert D. Bartlett has been appointed general manager of the **Franklin Steel Works,** Chicago, a subsidiary of the **Chicago Railway Equipment Company.** Mr. Bartlett graduated from the law department of the University of Michigan in 1907 and was admitted to the bar in Illinois in 1908. For 10 years he was identified with the New York Central Lines and the United States Railroad Administration in legal and operating capacities.

Robert D. Bartlett

In 1920 he became general manager of the Empire Freight Car Company, Kankakee, Ill., and from 1923 to 1931 he was successively secretary and treasurer, assistant to the president and vice-president of the Ryan Car Company, Chicago.

The Standard Car Truck Company, Chicago, has been appointed exclusive sales representative of the insulation division of the **Luse-Stevenson Company,** Chicago.

Maurice E. O'Brien and **Moxie S. George** have entered the employ of the **Inland Steel Company** as salesmen, the former in the Chicago office and the latter in the Milwaukee, Wis., office.

L. F. Duffy, associated with the Chicago office of the **Chicago Pneumatic Tool Company,** railroad division, for six years, has been transferred to the St. Louis, Mo., office, 1931 Washington avenue.

John M. Spangler, assistant general sales manager of the **National Carbon Company, Inc.,** New York, has been appointed general sales manager. Following his graduation from Penn State College

John M. Spangler

he served on the New York Central with its signal department chiefly at Albany, N. Y., and Rochester. In 1915 he entered the service of the National Carbon Company, Inc., and was appointed a salesman in its railroad department. Three years later he had been promoted to manager of the railroad division at Cleveland, Ohio. In 1923, Mr. Spangler went to Chicago to take over the direction of Western division sales and a few months later was appointed manager of the Western division, one of the three national organization units of the company. He remained in this position until 1930 when he was appointed manager of the Eastern division in New York. Later he became associated with the general sales division and about a year ago was appointed assistant general sales manager, which position he held until his recent promotion to general sales manager.

William Miller, senior vice-president of the **Pyle-National Company,** Chicago, has been elected president to succeed **Lawrence H. Vilas** who died on July 22. Mr. Miller was born in Hannibal Mo., on July 3, 1867, and began his railroad career as an apprentice in the Hannibal shops of the Chicago, Burlington & Quincy in June, 1882. In 1885 he served as a journeyman on the Missouri-Kansas-Texas, in 1886 on the Wabash, and in 1887 on the Denver & Rio Grande Western. In 1889 he was appointed foreman of shops of the St. Louis-San Francisco, which position he held until

1900 when he was made general foreman of the Colorado Midland. He held the latter position until 1904 when he became master mechanic of the Terminal Railroad Association and the Wiggins Ferry railroad of St. Louis. In 1905 he returned to the Denver & Rio Grande Western as master mechanic and assistant superintendent, holding the position until 1907 when

William Miller

he became superintendent of motive power of the Western Maryland. In 1908 he left railroad service to become vice-president of the Adreon Manufacturing Company, which position he held until 1910 when he was elected president of the Monarch Pneumatic Tool Company and vice-president of the Standard Railway Equipment Company. He resigned from these positions in 1913 to become vice-president of the Pyle-National Company. In 1914 he was elected senior vice-president, which position he has held until his election as president on August 2.

Railway Appliance Manufacturing Code Approved

The National Recovery Administration on August 2 announced approval of codes of fair competition, supplements of the approved code for the machinery and allied products industry, covering the Diesel engine manufacturing, jack manufacturing, concrete mixer and railway appliance manufacturing divisions. All four codes become effective on Sunday, August 12.

The maximum hours and minimum wage clauses of the basic code are carried over entirely into the supplements, providing for a 40 hour week, with certain emergency exceptions and for a sliding scale of minimum hourly wage rates, based upon population, as follows: 40 cents in cities of more than 50,000; 38 cents in cities of between 10,000 and 50,000 and 36 cents in cities of less than 10,000. The rate in the South is 32 cents.

In the case of all four codes, approval was granted, subject to a stay of the clause providing for a waiting period between the date of filing and effective date of price lists; and in the case of all except that of the concrete mixer division, which contains no such clause, that providing for manufacturer's control of distribution was stayed pending submission of satisfactory evidence covering the distribution of the products of the industry, to the Administrator. Additional stays were ordered as follows:—

Diesel Engine Division, clauses designed to closely restrict trade-in allowances and which would forbid "pool buying," pending further order. The proponent association was also ordered to amend its constitution and by-laws, regarding membership.

Railway Appliance Manufacturing Division, section in fair trade practice clause forbidding the supplying of parts, by a member of the industry, other than the maker, of an industry product hearing the maker's name or trade mark, so long as the maker is still manufacturing that article, stayed for fifteen days; and two others, one forbidding the acceptance of used products of the industry as partial payment of new articles and the other to limit the furnishings any prospective buyer by a member of the industry with detailed drawings of the products of the subdivision, stayed pending further order by the Administrator.

Special Track Equipment Code Authority

The following members of the Code Authority of the railroad special track equipment manufacturing industry have been approved by the National Recovery Administration: R. L. Gillespie, manager of sales, railroad division, Bethlehem Steel Company, Bethlehem, Pa.; E. H. Baumgarten, secretary and treasurer, Conley Frog & Switch Company, Memphis, Tenn.; Carrol Burton, president, Lorain Steel Company, Johnstown, Pa.; G. R. Lyman, sales manager, Pettibone-Mulliken Company, Chicago; R. S. Hays, president and chairman of the board, Frog, Switch & Manufacturing Company, Carlisle, Pa.; Charles M. Griffith, vice-president, William Wharton Jr. & Company, Easton, Pa., and American Frog & Switch Company, Hamilton, Ohio; O. DeG. Vanderbilt, president, Weir Kilby Corporation, Cincinnati, Ohio; W. Homer Hartz, president, Morden Frog & Crossing Works, Chicago; G. C. Lucas, president and general manager, Cleveland Frog & Crossing Company, Cleveland, Ohio; J. B. Strong, vice-chairman, Racor Pacific Frog & Switch Company, Los Angeles, Cal., and president, Ramapo Ajax Corporation, New York.

OBITUARY

John W. Fox, railroad contractor at El Reno, Okla., died at Rochester, Minn., on August 6.

Construction

ILLINOIS CENTRAL.—A contract has been awarded to the Zittrell-Mills Company, Fort Dodge, Iowa, for the construction of a 40 x 80 ft. warehouse at Bloomington, Iowa.

OREGON ELECTRIC.—This company is planning to construct a 7½-mile extension of its line from Forrest Grove, Ore., to the mill site of the Stimson Lumber Company in Washington county, Ore.

SEABOARD AIR LINE.—A contract has been awarded the Ross & White Company, Chicago, for the construction of a fireproof, overhead storage, automatic electric locomotive coaling and sanding plant at Elberton, Ga. The plant is designed to supply coal and sand and remove cinders from locomotives with one stop of the engine.

Financial

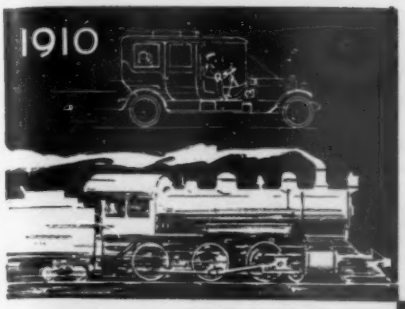
ATLANTIC COAST LINE.—*Accounting For Road Purchases.*—The Interstate Commerce Commission has issued a report and order finding that $9,428,713 represents the maximum amount to be apportioned to the investment in road and equipment of the Atlanta, Birmingham & Coast under account 41, "cost of road purchased," covering its acquisition in 1927 of the property and assets of the Atlanta, Birmingham & Atlantic. The question of this accounting has been a matter of controversy with the commission and its Bureau of Accounts for several years. The company had proposed to include in its investment account, as of January 1, 1927, the amount of $29,471,859, largely based on the commission's valuation of the A. B. & A. property, but the commission has based its decision on the current cash value of the consideration moving from the Coast company in the acquisition of the properties, including $4,248,413 as representing its liability on account of an issue of non-par stock and $5,180,300 as its liability on account of an issue of preferred stock.

BALTIMORE & OHIO.—*Trackage Rights.*—The Interstate Commerce Commission has authorized this company to operate over the Cleveland & Pittsburgh (subsidiary of the Pennsylvania) between Dover, Ohio, and Valley Junction under a formal trackage right contract. Heretofore the operation has been conducted at the standard detour charge.

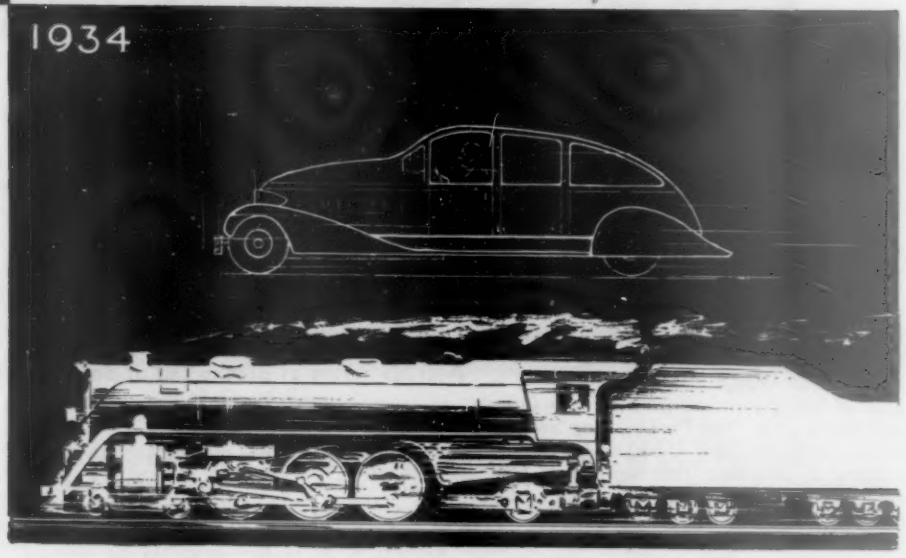
CHICAGO & NORTH WESTERN.—*Abandonment.*—The Interstate Commerce Commission has authorized this company to abandon an 0.7-mile segment of a branch line at Blacktail, S. D.

CHICAGO & WESTERN INDIANA.—*Bonds.*—The Interstate Commerce Commission has authorized this company to issue $6,340,000 of first and refunding mortgage series A bonds to be sold at par and the proceeds used to pay the unpaid balance of a loan from the federal government. Arrangements have been made to sell the issue at par to Brown, Harriman & Co., Inc., and Edward B. Smith & Co., New York.

DELTA VALLEY & SOUTHERN.—*Acquisition and Operation.*—The Interstate Commerce Commission has authorized this company to acquire and operate a line, formerly the Evadale branch of the St. Louis-San Francisco, extending from Deckerville, Ark., to Evadale Junction, 18.1 miles. The Frisco has been authorized to abandon the line, subject to its sale at salvage value to



THERE IS OPERATING PROFIT *With* MODERN POWER!



Between 1910 and 1934 the steam locomotive has improved as much as the automobile.

Today the steam locomotive offers you maximum safety, any capacity you can use, any speed you can use, with maximum economy of operation and maintenance.

A locomotive designed to suit the needs of your particular service; passenger or freight, main line or branch, will show a return of at least 20% on your investment.

LIMA LIMA LOCOMOTIVE WORKS INCORPORATED OHIO

any responsible interests willing to operate the line, which accordingly the new company proposes to do.

ERIE.—*Acquisition.*—This company has applied to the Interstate Commerce Commission for authority to acquire the terminal facilities at Jamestown, N. Y., now owned by the Jamestown, Westfield & Northwestern.

ILLINOIS CENTRAL.—*Abandonment.*—The Interstate Commerce Commission has authorized this company to abandon a line extending from Crain, Ill., to Sand Ridge, 17.4 miles, and from Mounds to Olive Branch, 10.7 miles, and to abandon operation under trackage rights over the Chicago & Eastern Illinois between Olive Branch and Thebes, 9.4 miles.

MINNEAPOLIS & ST. LOUIS.—*Reorganization.*—The protective committee for the Iowa Central first mortgage 5 per cent bonds has addressed a circular letter to the holders of these securities calling attention to the date—September 5—which has been set for selling the property at foreclosure and urging the advisability of a plan of reorganization which would forestall this action. The Participating Securities Corporation, New York, has addressed holders of Merriam Junction-Albert Lea extended first 6 per cents (due 1932), the first consolidated 5 per cents (due 1934) and the Iowa Central first 5 per cents (due 1938) recommending that any plan for reorganization should leave the system with not more than $10,000,000 of bonded debt (including income bonds); that holders of receivers' certificates, preferred claims and the Merriam Junction-Albert Lea issue should receive cash or new bonds for the full amount of their holdings; that next in preference should come, in the order named, the first consolidated 5 per cents and the Iowa Central mortgage bonds; that the equity of other bonds is slight or non-existent and that of the stockholders completely non-existent; and that cash needed above amounts the Reconstruction Finance Corporation is willing to advance be secured by an assessment devolving primarily on the first consolidated 5 per cents and the Iowa Central first 5 per cents.

MISSOURI-KANSAS-TEXAS.—*To Become Proprietor in Kansas City Terminal.*—This company has applied to the Interstate Commerce Commission for authority to continue to operate over the terminal facilities of the Kansas City Terminal and to become a proprietary company by entering into an agreement with the terminal company and the other proprietary com-

NEW YORK CENTRAL.—*Abandonment.*—This company and the Boston & Albany have applied to the Interstate Commerce Commission for authority to abandon part of the Athol branch of the latter, from Bondsville, Mass., to Athol, 29 miles.

NORTHERN PACIFIC. — *Abandonment.*—The Interstate Commerce Commission, Division 4, has authorized this company to abandon part of its Sunset branch, in Shoshone county, Idaho.

NORTHERN PACIFIC. — *Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon its line from St. Regis, Mont., to Haugan, 18.87 miles, and to operate over the line of the Chicago, Milwaukee, St. Paul & Pacific between those points, 18.5

ST. LOUIS SOUTHWESTERN. — *Abandonment.*—This company and the Pine Bluff & Arkansas River have applied to the Interstate Commerce Commission for authority to abandon the latter's line from Reydel, Ark., to Rob Roy, 26.4 miles.

TEXAS & NEW ORLEANS. — *Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon its line from Hutchins, Tex., to Lancaster, 4.7 miles.

WINCHESTER & WARDENSVILLE. — *Abandonment.*—In a proposed report Examiner Molster of the Interstate Commerce Commission has recommended that the commission approve the abandonment of part of this company's line from Rock Enon, Va., to Wardensville, 16.8 miles.

Average Prices of Stocks and of Bonds

	Aug. 7	Last week	Last year
Average price of 20 representative railway stocks..	33.71	34.72	45.08
Average price of 20 representative railway bonds..	73.93	74.45	73.90

Dividends Declared

Northern R. R. of New Jersey.—4 Per Cent Guaranteed, $1.00, quarterly, payable September 1 to holders of record August 21.

Portland & Ogdensburg.—Guaranteed, 50c, quarterly, payable August 31 to holders of record August 20.

Rutland & Whitehall.—$1.50, payable August 15 to holders of record August 1.

Railway Officers

OPERATING

W. A. Drago has been appointed superintendent of terminals at Memphis, Tenn., for the St. Louis-San Francisco, succeeding **John Burch,** who has been transferred to Kansas City, Mo., to replace **J. W. Skaggs,** deceased.

H. E. Hinshaw, trainmaster on the McCook division of the Chicago, Burlington & Quincy, at McCook, Neb., has been promoted to assistant superintendent at Wymore, Neb., succeeding **E. C. Hale,** who has been transferred to Omaha to replace **K. W. Fischer,** promoted.

ENGINEERING AND SIGNALING

J. H. Morgan, track supervisor for the Florida East Coast with headquarters at New Smyrna, Fla., has been appointed acting engineer maintenance of way at St. Augustine, Fla., succeeding **W. G. Brown,** deceased. Mr. Morgan was born on September 27, 1886, at Alma, Ark., and attended Virginia Military Institute and the University of Virginia. Before entering railroad service he served as rodman for the General Land Office and topographer on the Muscle Shoals survey under the War Department. In 1912 he entered the service of the St. Louis-San Francisco as transitman. From 1914 to 1917 Mr. Morgan served as an instrumentman and assistant engineer for the Southern. He became, in 1917, assistant engineer for the Jacksonville Terminal on the construction of the new Jacksonville terminal. He returned to the Southern in 1921 as engineer of trackwork. He has been employed by the Florida East Coast consecutively since 1924 as resident engineer, roadmaster and track supervisor.

TRAFFIC

H. E. Mack, Jr., assistant manager of mail and express traffic of the Missouri Pacific, has been advanced to manager of mail and express traffic, with headquarters as before at St. Louis, Mo., succeeding **H. E. Mack, Sr.,** deceased.

SPECIAL

K. W. Fischer, assistant superintendent on the Omaha division of the Chicago, Burlington & Quincy, with headquarters at Omaha, Neb., has been appointed superintendent of the relief and employment department and chairman of the pension board, with headquarters at Chicago, succeeding **J. T. Williamson,** who has been appointed a member of the Railroad Retirement board.

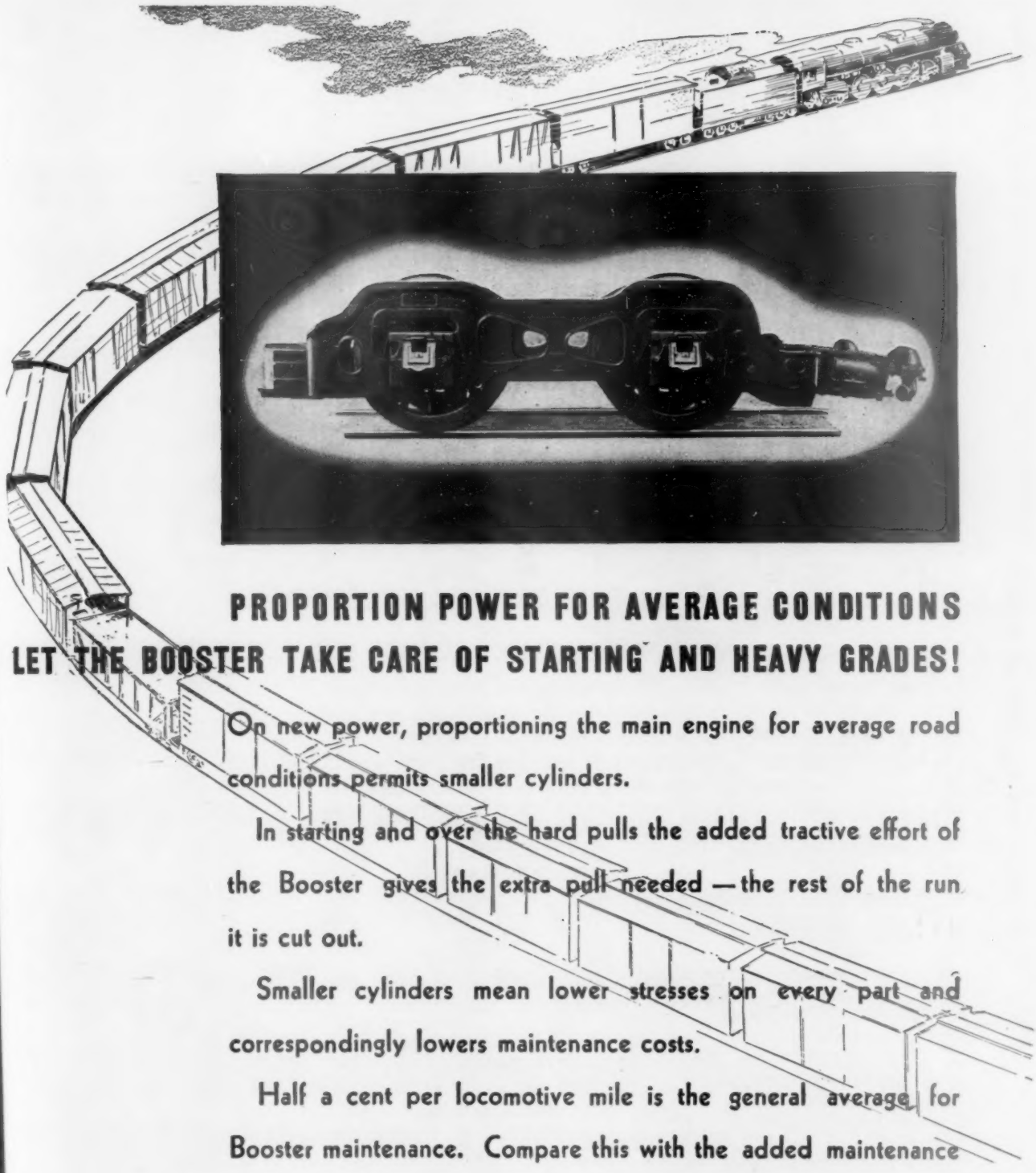
OBITUARY

H. E. Mack, Sr., manager of mail and express traffic of the Missouri Pacific, with headquarters at St. Louis, Mo., died on July 27.

Charles L. Andrus, general counsel for the New York, Ontario & Western at New York who died on July 14, as reported in the *Railway Age* of August 4, was born in 1859, in Roxbury, N. Y. He practiced law in Delaware County, N. Y., until 1913 when he entered the service of the N. Y., O. & W. as head of the legal department. He was also president of the National Bank of Stamford, N. Y.; vice-president of the First National Bank of Delhi, N. Y., and a director of the International Business Machines Corporation. He was a member of the New York City and State Bar Associations.

R. H. Newbern, retired manager of the insurance department of the Pennsylvania, died on August 4 at his home in Philadelphia. Mr. Newbern, who was 68 years old, had been in poor health for several weeks. A native Philadelphian, he spent his entire business career in the service of the Pennsylvania. He began work in the accounting department in June, 1883, transferring to the insurance department five years later. He was appointed assistant superintendent of the department in January, 1901, and superintendent in November, 1907. In February, 1930, he was appointed manager of the department. Mr. Newbern retired in April of last year after a half century of railroad work.

Tables of Revenues and Expenses of Railways begin on next left-hand page



PROPORTION POWER FOR AVERAGE CONDITIONS
LET THE BOOSTER TAKE CARE OF STARTING AND HEAVY GRADES!

On new power, proportioning the main engine for average road conditions permits smaller cylinders.

In starting and over the hard pulls the added tractive effort of the Booster gives the extra pull needed—the rest of the run it is cut out.

Smaller cylinders mean lower stresses on every part and correspondingly lowers maintenance costs.

Half a cent per locomotive mile is the general average for Booster maintenance. Compare this with the added maintenance cost of larger cylinders and an extra pair of drivers.

All replacement parts furnished by Franklin Railway Supply Company are identical as to materials, design, clearances and workmanship with the parts they replace. They guarantee the same unfailing reliability of service.

FRANKLIN RAILWAY SUPPLY COMPANY, INC.

NEW YORK CHICAGO MONTREAL

Revenues and Expenses of Railways

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1934

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of: Way and structures	Equipment	Traffic	Transportation	General	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income	Net ry. operating income, 1933
Akron, Canton & Youngstown	June	171	$137,963	$47	$146,626	$20,493	$15,463	$76,620	$41,847	$8,440	$93,863	64.0	$52,763	$41,783	$25,949	$46,044
	6 mos.	171	866,216	195	923,734	113,611	86,342	45,860	267,691	46,656	560,128	60.6	363,606	298,249	201,466	123,313
Alton	June	950	839,321	148,548	1,148,377	184,990	173,282	47,792	419,423	39,185	874,732	76.2	273,645	201,208	56,942	252,261
	6 mos.	950	4,443,129	756,516	6,126,038	808,284	955,980	273,339	2,521,626	260,633	4,881,942	79.7	1,244,096	812,982	12,278	506,786
Atchison, Topeka & Santa Fe	June	9,532	7,946,971	1,092,988	9,886,207	1,342,215	2,044,689	311,615	3,091,773	358,942	7,148,682	72.3	2,737,525	1,951,081	2,132,054	1,816,430
	6 mos.	9,544	40,460,178	5,319,306	50,380,962	6,641,531	12,360,634	1,815,514	17,530,274	2,172,650	40,530,873	80.4	9,850,089	5,214,974	5,814,657	2,062,618
Gulf, Colorado & Santa Fe	June	1,918	950,231	47,845	1,071,351	195,067	260,572	50,471	382,461	59,498	948,043	88.5	123,308	40,884	—34,290	113,325
	6 mos.	1,918	4,846,108	258,774	5,558,918	1,236,680	1,534,823	292,093	2,213,973	378,133	5,655,379	101.7	—96,461	—591,804	—1,067,491	—723,683
Panhandle & Santa Fe	June	1,878	789,390	23,238	860,420	90,997	169,703	17,811	220,939	34,257	533,580	62.0	326,840	283,065	211,824	81,903
	6 mos.	1,878	3,702,235	144,479	4,132,736	515,838	943,231	105,024	1,221,587	190,792	2,976,298	72.0	1,156,438	890,923	450,414	72,806
Atlantic & West Point	June	93	70,839	17,304	104,839	21,268	27,614	6,676	47,582	6,967	112,375	107.2	—7,536	—14,762	—25,511	—9,253
	6 mos.	93	488,708	97,415	702,857	117,162	161,617	40,417	288,831	45,342	666,249	94.8	36,608	—6,715	—71,947	—133,701
Western of Alabama	June	133	66,896	17,443	95,729	18,991	32,180	6,751	41,425	6,524	107,605	112.4	—11,876	—19,886	—12,310	2,596
	6 mos.	133	466,472	100,428	651,383	122,971	189,904	40,871	262,921	42,682	669,686	102.8	—18,303	—66,357	—33,547	—24,050
Atlanta, Birmingham & Coast	June	639	179,068	7,321	214,090	44,151	50,097	20,644	97,641	14,989	237,186	110.8	—23,096	—35,607	—41,821	—21,262
	6 mos.	639	1,218,013	33,131	1,425,359	244,961	312,551	127,911	593,387	94,592	1,431,085	100.4	—5,726	—80,929	—159,115	—168,183
Atlantic Coast Line	June	5,145	2,438,715	256,272	2,980,004	402,059	691,223	107,095	1,202,945	126,227	2,543,452	85.4	436,552	136,113	16,044	377,332
	6 mos.	5,145	17,114,822	3,275,767	23,012,271	2,593,904	4,025,054	686,828	7,861,260	776,382	16,170,105	70.3	6,842,166	4,139,915	3,376,034	3,364,657
Charleston & Western Carolina	June	342	146,355	1,123	150,981	22,175	28,071	5,658	51,946	4,489	112,339	74.4	38,642	21,604	19,464	36,850
	6 mos.	342	1,027,025	6,649	1,060,701	143,536	150,049	33,774	328,200	28,152	683,711	64.5	376,990	275,924	253,996	229,266
Baltimore & Ohio	June	6,384	10,852,876	970,363	12,640,365	1,096,095	2,458,900	364,129	4,007,251	594,537	8,633,799	68.3	4,006,566	3,323,019	2,846,181	3,495,529
	6 mos.	6,384	60,342,950	4,872,571	69,704,759	6,132,975	15,707,501	2,118,116	24,108,765	3,359,732	51,974,388	74.6	17,730,371	13,635,573	11,575,858	11,038,965
Staten Island Rapid Transit	June	23	47,141	87,491	144,458	12,431	12,599	2,256	79,184	12,395	118,865	82.3	25,593	8,943	—5,265	19,024
	6 mos.	23	330,293	490,433	866,699	60,960	77,758	10,408	488,385	77,069	714,580	82.4	152,119	59,962	—44,536	5,756
Bangor & Aroostook	June	603	294,865	14,851	329,198	96,552	83,939	4,827	95,736	22,806	305,027	92.7	24,171	—873	11,798	21,644
	6 mos.	603	3,355,795	182,399	3,663,559	591,123	541,152	27,497	801,392	138,553	2,104,326	57.4	1,559,233	1,241,624	1,195,443	1,281,959
Bessemer & Lake Erie	June	225	1,172,217	486	1,182,983	125,312	320,058	11,045	172,496	32,666	661,358	55.9	521,625	467,764	460,406	329,726
	6 mos.	225	3,775,618	4,685	3,834,656	515,200	1,714,514	66,378	801,915	200,942	3,297,820	86.0	536,836	407,308	499,775	108,798
Boston & Maine	June	2,038	2,396,930	599,749	3,526,795	573,487	444,030	58,692	1,361,267	176,473	2,622,696	74.4	904,099	694,647	542,701	963,729
	6 mos.	2,055	15,246,461	3,383,932	21,713,924	3,141,844	3,496,935	341,882	8,664,928	1,020,022	16,723,398	77.0	4,990,526	3,817,436	2,777,102	3,094,016
Brooklyn Eastern Dist. Term	June	...	84,400	...	86,342	3,888	9,843	318	27,101	5,186	46,336	53.66	40,006	33,370	33,370	39,967
	6 mos.	...	465,124	...	478,512	24,997	45,883	2,015	156,890	29,850	259,635	49.61	218,877	179,696	179,696	157,063
Burlington-Rock Island	June	280	56,189	3,930	64,971	14,233	12,383	4,098	39,014	7,220	76,948	118.4	—11,977	—16,816	—23,497	475
	6 mos.	280	344,786	8,893	378,037	66,553	76,141	21,978	216,872	42,837	424,377	112.3	—46,340	—75,267	—126,095	—75,775
Cambria & Indiana	June	37	76,795	...	76,969	11,381	38,979	383	10,567	7,324	68,634	89.17	8,335	—3,787	49,791	67,014
	6 mos.	37	517,746	...	518,938	42,005	236,323	2,360	68,357	42,241	391,286	75.40	127,652	42,601	438,168	442,442
Canadian Pac. Lines in Maine	June	233	85,495	19,286	119,829	50,915	25,431	8,619	48,514	5,806	140,067	116.8	—20,238	—26,244	—53,603	—45,524
	6 mos.	233	1,067,759	92,583	1,236,844	224,266	209,410	52,589	457,452	35,830	983,220	79.5	253,624	213,582	68,514	9,591
Canadian Pac. Lines in Vermont	June	85	52,935	10,517	78,987	15,872	20,166	3,832	50,444	4,189	94,801	120.0	—15,814	—20,914	—37,121	—11,029
	6 mos.	85	347,213	58,568	492,216	84,920	125,630	23,457	326,805	24,395	586,924	119.2	—94,708	—125,323	—227,124	—231,146
Central of Georgia	June	1,926	830,973	90,929	1,034,068	164,777	262,713	49,467	441,699	70,659	992,330	96.0	41,738	—31,547	—66,002	135,627
	6 mos.	1,926	5,295,781	573,785	6,690,202	829,058	1,586,334	291,627	2,654,611	414,844	5,809,748	86.8	880,454	439,262	179,110	95,010
Central New Jersey	June	689	1,843,525	405,707	2,425,955	152,640	498,438	48,024	947,303	81,995	1,744,967	71.9	680,988	327,065	262,990	186,499
	6 mos.	689	11,859,322	2,083,962	14,881,667	851,631	2,843,208	250,183	5,869,623	526,049	10,428,582	70.0	4,453,085	2,926,640	2,302,558	1,346,511
Central Vermont	June	455	354,183	32,001	432,330	124,811	86,154	13,116	186,711	20,411	431,250	99.75	1,080	—15,040	—27,196	40,146
	6 mos.	455	2,078,904	214,679	2,528,448	464,840	558,293	77,821	1,186,513	120,496	2,408,215	95.24	120,233	23,375	—38,273	—8,771
Chesapeake & Ohio	June	3,143	8,931,330	255,845	9,587,110	1,037,394	1,690,222	166,836	2,025,299	293,319	5,222,702	54.5	4,364,408	3,482,101	3,251,740	3,206,598
	6 mos.	3,128	51,795,907	1,382,598	55,094,786	5,691,438	10,436,964	975,580	11,982,948	1,663,776	30,815,577	55.9	24,279,209	19,043,067	18,404,726	14,730,881
Chicago & Eastern Illinois	June	938	791,501	104,086	1,031,623	135,165	142,254	49,445	409,906	53,577	797,292	77.3	234,331	181,300	61,158	53,770
	6 mos.	938	4,976,716	491,558	6,201,471	763,817	1,029,120	297,713	2,547,043	333,074	4,989,963	80.5	1,211,508	797,568	79,966	—358,697
Chicago & Illinois Midland	June	131	205,290	884	212,678	27,779	41,655	14,493	54,283	15,756	153,994	72.4	58,684	51,104	59,651	86,096
	6 mos.	131	1,317,795	6,001	1,363,990	155,193	296,143	93,187	369,259	96,226	1,010,011	74.0	353,979	310,605	333,649	426,797
Chicago & North Western	June	8,442	5,074,146	964,381	6,813,198	1,445,079	1,560,377	174,971	2,498,187	271,730	5,983,404	87.8	829,794	278,096	80,225	1,086,955
	6 mos.	8,442	28,193,449	3,893,981	36,271,016	5,331,225	8,439,574	912,288	14,470,935	1,616,177	30,934,039	85.3	5,336,977	2,025,808	919,286	—442,564
Chicago, Burlington & Quincy	June	9,182	5,039,371	637,655	6,416,673	1,253,998	986,327	242,561	2,275,235	284,923	5,088,844	79.3	1,327,829	726,230	419,182	1,446,747
	6 mos.	9,182	30,337,131	2,768,462	37,276,148	4,884,564	6,282,469	1,302,782	13,713,041	1,708,261	28,122,428	75.4	9,153,720	5,626,721	3,935,322	3,263,779
Chicago Great Western	June	1,518	1,079,930	48,049	1,207,427	167,970	182,758	50,334	447,536	49,127	894,832	74.1	312,595	255,061	66,316	256,492
	6 mos.	1,518	6,445,937	233,705	7,133,001	924,501	1,138,846	305,717	2,797,899	281,248	5,441,987	76.3	1,691,014	1,357,453	271,697	—1,518
Chicago, Indianapolis & Louisville	June	644	461,953	47,305	592,597	53,832	136,439	25,319	247,288	28,400	496,884	83.8	95,713	45,305	—49,955	49,406
	6 mos.	644	2,911,613	259,781	3,622,411	316,674	874,661	148,378	1,538,646	142,133	3,053,992	84.3	568,419	291,122	—271,767	—188,627

Continued on next left-hand page

AMERICAN ARCH COMPANY

Combines The Elements

THAT MAKE A

Satisfactory Arch

Good Arch Brick coupled with sound design and competent service go to make a satisfactory locomotive arch.

American Arch Company combines all three elements.

Arch Brick is furnished by the following strategically located manufacturers possessed of high-grade clay deposits and well experienced in brick making:

HARBISON-WALKER REFRACTORIES CO.
Pennsylvania Ohio Kentucky
Alabama Missouri

NORTH AMERICAN REFRACTORIES CO.
Pennsylvania Kentucky

IRONTON FIRE BRICK CO.
Ohio

DENVER SEWER PIPE & CLAY CO.
Colorado

ATHENS BRICK & TILE CO.
Texas

MOULDING-BROWNELL CORP.
Ohio

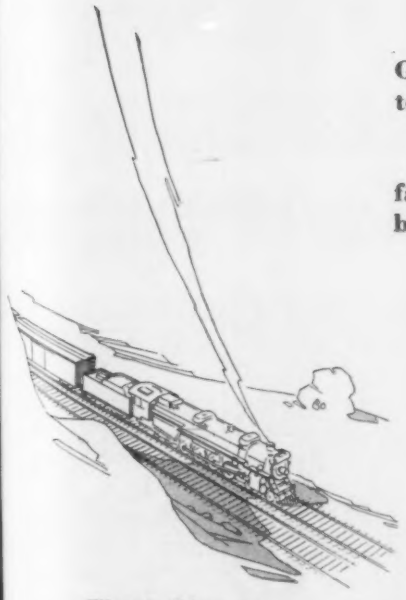
GLADDING-McBEAN & CO.
California
Washington

DIAMOND FIRE BRICK CO.
Colorado

DOMINION FIRE BRICK & CLAY PRODUCTS, LTD.
Saskatchewan, Canada

CANADA FIRE BRICK CO., LTD.
Ontario, Canada—Quebec, Canada

LOUISVILLE FIRE BRICK WORKS
Kentucky



There's More to
SECURITY ARCHES
Than Just Brick

AMERICAN ARCH COMPANY

INCORPORATED

Locomotive Combustion Specialists

NEW YORK CHICAGO

Revenues and Expenses of Railways

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1934—CONTINUED

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures	Maintenance of Equipment	Traffic	Transportation	General	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income	Net ry. operating income, 1933
Chicago, Mil., St. Paul & Pacific	June	11,165	$56,90,560	$574,684	$7,057,347	$1,248,194	$1,439,735	$223,172	$2,644,994	$251,324	$5,827,930	82.6	$1,229,417	$687,546	$226,178	$1,840,024
	6 mos.	11,177	34,392,484	2,302,159	40,952,214	4,915,938	8,626,968	1,180,125	16,045,809	1,511,343	32,416,274	79.2	8,535,940	5,031,246	2,588,429	2,926,578
Chicago, Rock Island & Pacific	June	7,593	4,808,808	499,871	5,859,554	580,522	1,453,014	185,203	2,151,587	267,695	4,702,631	80.3	1,156,923	740,157	442,920	1,362,268
	6 mos.	7,609	25,118,380	2,591,135	30,914,480	3,089,823	7,496,738	1,060,857	12,611,220	1,660,395	26,270,242	85.0	4,644,238	2,150,380	516,869	1,484,880
Chicago, Rock Island & Gulf	June	721	302,293	18,861	326,123	43,774	24,619	16,895	124,559	18,778	231,452	71.0	94,671	73,062	12,398	4,485
	6 mos.	721	1,560,189	111,157	1,705,908	227,493	229,935	93,164	666,346	109,906	1,341,803	78.7	364,105	235,558	—105,340	—137,953
Chic., St. Paul, Minn. & Omaha	June	1,663	907,992	143,125	1,161,194	151,000	201,146	35,493	550,490	67,808	1,016,128	87.5	145,066	72,836	10,429	374,708
	6 mos.	1,663	5,769,711	597,120	6,916,249	744,364	1,176,433	191,802	3,273,560	396,633	5,831,290	84.3	1,084,959	635,368	224,712	242,324
Clinchfield R. R.	June	309	385,312	3,489	393,005	42,931	99,288	15,722	75,589	12,522	246,052	62.6	146,953	106,952	136,615	151,592
	6 mos.	309	2,788,498	18,135	2,838,966	243,938	627,613	94,040	493,109	77,481	1,536,181	54.1	1,302,785	1,062,717	1,229,109	745,340
Colorado & Southern	June	1,029	410,169	27,970	480,449	125,864	99,248	12,443	159,154	31,304	428,603	89.2	51,846	—5,183	—16,806	—36,814
	6 mos.	1,029	2,070,220	124,772	2,458,662	444,445	537,001	68,407	970,628	189,989	2,212,439	90.0	246,223	—92,882	—182,837	—259,068
Ft. Worth & Denver City	June	804	515,190	36,938	612,548	45,972	71,690	17,082	158,449	30,644	325,930	53.2	286,618	255,157	224,286	132,231
	6 mos.	804	2,176,134	184,613	2,699,272	192,365	410,828	94,786	828,786	187,866	1,724,028	63.9	975,244	793,838	624,413	441,998
Columbus & Greenville	June	167	43,775	5,170	54,528	13,158	10,939	4,196	27,098	8,698	64,079	117.5	—9,551	—12,195	—9,243	16,148
	6 mos.	167	341,790	30,365	403,789	82,584	64,949	21,119	178,720	52,976	400,338	99.1	3,451	—12,740	—7,196	15,115
Delaware & Hudson	June	848	1,723,402	79,799	1,928,343	283,946	509,101	48,331	720,244	133,892	1,699,643	88.1	228,700	158,270	165,531	92,382
	6 mos.	848	11,258,067	510,781	12,381,060	1,676,158	3,164,404	282,620	4,727,298	803,112	10,679,697	86.3	1,701,363	1,279,171	1,369,576	—684,926
Delaware, Lackawanna & Western	June	992	2,864,993	591,288	3,953,990	391,640	747,133	113,549	1,588,046	152,900	3,002,458	75.9	951,532	600,567	570,535	672,714
	6 mos.	993	17,289,576	3,225,179	23,291,371	1,724,544	4,599,796	642,549	10,044,672	917,074	18,067,902	77.6	5,223,469	3,117,912	2,973,272	867,517
Denver & Rio Grande Western	June	2,558	1,185,643	78,002	1,351,713	176,476	361,774	48,548	444,782	87,551	1,125,796	83.3	225,917	75,251	55,530	196,530
	6 mos.	2,483	7,219,233	352,603	8,071,097	909,181	2,019,819	267,435	2,649,039	463,995	6,333,277	78.5	1,737,820	835,703	832,104	581,848
Denver & Salt Lake	June	232	82,458	3,824	95,213	11,529	18,616	1,179	21,492	10,258	63,074	66.2	32,139	19,139	40,333	45,341
	6 mos.	232	487,367	19,928	564,557	66,088	119,879	9,070	132,387	65,242	392,666	69.6	171,891	88,853	122,005	186,180
Detroit & Mackinac	June	242	34,186	2,557	44,782	13,120	8,330	900	19,944	3,329	45,599	101.8	—817	—3,711	—3,904	5,444
	6 mos.	242	227,693	16,008	277,463	57,918	44,679	5,191	124,319	20,705	252,770	91.1	24,693	36,449	28,380	—5,496
Detroit & Toledo Shore Line	June	50	185,481	...	187,136	24,104	15,125	7,205	52,314	6,346	105,043	56.1	82,093	67,960	33,804	31,040
	6 mos.	50	1,679,297	...	1,689,983	125,436	130,426	40,219	403,811	38,712	738,538	43.7	951,445	802,414	505,990	259,432
Detroit, Toledo & Ironton	June	472	443,062	250	460,753	46,900	73,824	9,848	113,017	17,667	257,743	55.9	203,010	157,285	134,049	87,274
	6 mos.	472	3,297,948	1,594	3,401,928	283,570	433,892	59,559	722,019	102,825	1,580,974	46.5	1,820,954	1,476,857	1,318,743	397,200
Duluth Missabe & Northern	June	563	1,437,981	1,821	1,649,494	164,015	195,941	4,039	248,506	34,431	646,892	39.2	1,002,602	905,864	908,830	253,467
	6 mos.	563	2,851,538	16,564	3,326,097	764,202	1,340,072	19,144	973,027	229,557	3,325,950	100.0	147	—417,395	—412,805	—695,905
Duluth, Winnipeg & Pacific	June	178	61,384	2,946	67,062	24,554	16,708	1,953	31,908	4,977	80,062	119.4	—13,000	—16,953	—10,743	13,737
	6 mos.	178	402,759	12,566	430,725	103,278	106,501	11,266	203,183	31,122	455,316	105.7	—24,591	—47,357	—1,272	—29,402
Elgin, Joliet & Eastern	June	446	963,490	1	1,111,831	108,553	251,586	12,290	369,901	38,998	781,295	70.3	330,536	251,063	209,861	243,353
	6 mos.	446	5,193,045	6	5,767,293	546,427	1,365,851	73,950	2,086,576	251,042	4,323,623	75.0	1,443,670	960,188	699,660	45,594
Erie Railroad	June	2,315	5,484,595	469,672	6,558,630	707,780	1,359,410	167,471	2,231,872	279,903	4,749,239	72.4	1,809,391	1,474,229	1,130,197	1,552,980
	6 mos.	2,315	33,077,398	2,493,679	38,557,115	3,358,041	7,667,452	950,415	13,483,485	1,670,637	27,180,797	70.5	11,376,318	9,364,977	7,480,314	4,691,005
New Jersey & New York	June	45	14,012	52,085	68,408	8,381	23,075	1,132	45,158	3,284	81,030	118.4	—12,622	—16,773	—32,641	—24,506
	6 mos.	45	103,306	325,671	441,145	45,031	145,650	7,435	304,759	21,549	524,424	118.9	—83,279	—108,206	—206,808	—158,662
N. Y., Susquehanna & Western	June	215	247,721	27,156	292,839	35,258	63,939	4,151	115,754	12,435	231,537	79.1	61,302	37,154	16,966	14,559
	6 mos.	215	1,692,948	158,190	1,949,387	173,589	355,903	25,903	755,039	71,412	1,381,845	70.9	567,542	423,937	308,903	97,502
Florida East Coast	June	812	218,295	63,991	330,625	110,047	130,170	19,140	160,175	35,719	460,374	139.2	—129,749	—205,027	—256,773	—213,407
	6 mos.	831	3,162,789	1,241,564	5,020,387	674,357	793,397	122,988	1,369,107	223,587	3,237,343	64.5	1,783,044	1,330,879	997,827	845,456
Fort Smith & Western	June	249	46,763	1,051	51,172	13,845	8,536	5,072	16,638	3,975	48,213	94.2	2,959	1,756	—3,530	—3,679
	6 mos.	249	285,080	6,088	314,678	84,381	59,215	30,501	109,668	23,885	302,619	96.2	12,059	2,839	—24,824	—24,529
Georgia R. R.	June	329	203,605	16,627	239,799	29,565	53,224	15,994	110,467	12,804	222,542	92.8	17,257	11,982	17,608	41,886
	6 mos.	329	1,346,990	77,670	1,565,461	164,634	351,077	97,548	657,780	80,249	1,353,299	86.4	212,162	180,406	215,523	234,613
Georgia & Florida	June	465	88,043	2,543	95,590	21,024	18,493	7,405	37,439	5,441	89,838	94.0	5,752	748	—3,770	6,850
	6 mos.	465	509,512	12,280	553,104	129,384	105,734	45,389	210,130	33,083	524,470	94.8	28,634	—1,828	—19,112	—67,596
Grand Trunk Western	June	1,006	1,409,668	69,856	1,608,980	298,173	300,195	33,916	593,803	79,082	1,308,003	81.3	300,977	231,108	119,419	87,562
	6 mos.	1,007	8,417,287	336,620	9,445,823	1,186,794	1,908,640	195,660	3,790,653	474,174	7,577,121	80.2	1,868,702	1,408,846	686,380	—461,639
Canadian Nat'l Lines in New Eng.	June	172	68,635	5,537	82,438	33,752	14,609	2,820	44,847	8,466	104,799	127.1	—22,361	—35,080	—66,717	—68,186
	6 mos.	172	434,413	29,622	513,326	130,756	105,079	16,283	321,232	54,646	630,876	122.9	—117,550	—185,413	—396,605	—416,149
Great Northern	June	8,360	5,345,493	499,042	6,503,543	1,417,938	1,074,622	164,658	1,880,304	181,879	4,785,315	73.6	1,718,228	1,207,294	1,102,137	1,601,504
	6 mos.	8,361	25,147,795	1,837,133	29,801,671	4,067,877	5,790,096	1,003,891	10,340,720	1,169,263	22,663,055	76.0	7,138,616	3,888,892	3,175,721	1,456,518
Green Bay & Western	June	233	78,456	954	83,229	22,848	17,276	4,270	37,891	2,587	84,854	101.9	—1,625	—7,173	—11,759	220
	6 mos.	233	500,560	5,341	529,743	111,213	116,116	26,794	238,047	16,288	508,266	95.9	21,477	—11,331	—21,728	9,820
Gulf & Ship Island	June	259	68,080	7,565	85,565	12,284	13,191	2,557	42,762	4,608	75,398	88.1	10,167	—5,723	—15,790	5,555
	6 mos.	261	488,849	40,219	613,105	90,470	91,674	14,342	275,720	28,496	502,043	81.9	111,062	16,830	—46,167	—71,533

Continued on next left-hand page

Green Bay & Western	6 mos.	233	500,560												
	June	259	68,080												
	6 mos.	261	488,849												
Gulf & Ship Island															

ad page

THE

Re

60 East

NE

Cana

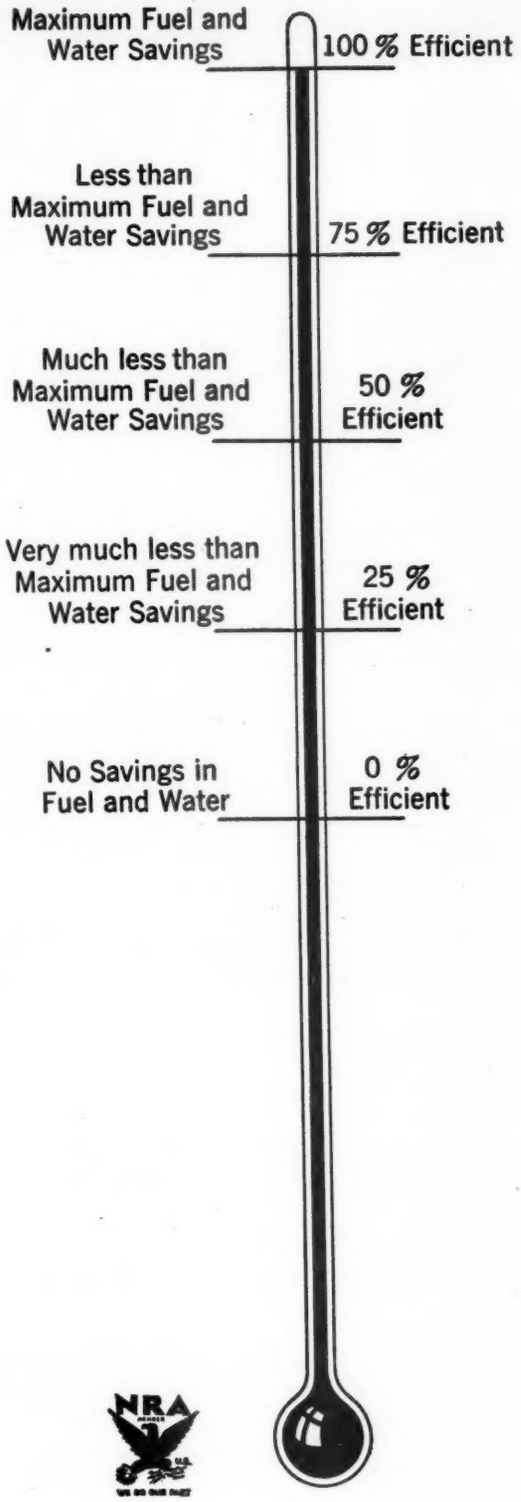
Superheate

Revenues and Expenses of Railways

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1934—CONTINUED

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures	Maintenance of Equipment	Traffic	Transportation	General	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income	Net ry. operating income, 1933
Chicago, Mil., St. Paul & Pacific	June	11,165	$56,90,560	$574,684	$7,057,347	$1,248,194	$1,439,735	$223,172	$2,644,994	$251,324	$5,827,930	82.6	$1,229,417	$687,546	$226,178	$1,840,024
	6 mos.	11,177	34,392,484	2,302,159	40,952,214	4,915,938	8,626,968	1,180,125	16,045,809	1,511,343	32,416,274	79.2	8,535,940	5,031,246	2,588,429	2,926,578
Chicago, Rock Island & Pacific	June	7,593	4,808,808	499,871	5,859,554	580,522	1,453,014	185,203	2,151,587	267,695	4,702,631	80.3	1,156,923	740,157	442,920	1,362,268
	6 mos.	7,609	25,118,380	2,591,135	30,914,480	3,089,823	7,496,738	1,060,857	12,611,220	1,660,395	26,270,242	85.0	4,644,238	2,150,380	516,869	1,484,880
Chicago, Rock Island & Gulf	June	721	302,293	18,861	326,123	43,774	24,619	16,895	124,559	18,778	231,452	71.0	94,671	73,062	12,398	4,485
	6 mos.	721	1,560,189	111,157	1,705,908	227,493	229,935	93,164	666,346	109,906	1,341,803	78.7	364,105	235,558	—105,340	—137,953
Chic., St. Paul, Minn. & Omaha	June	1,663	907,992	143,125	1,161,194	151,000	201,146	35,493	550,490	67,808	1,016,128	87.5	145,066	72,836	10,429	374,708
	6 mos.	1,663	5,769,711	597,120	6,916,249	744,364	1,176,433	191,802	3,273,560	396,633	5,831,290	84.3	1,084,959	635,368	224,712	242,324
Clinchfield R. R.	June	309	385,312	3,489	393,005	42,931	99,288	15,722	75,589	12,522	246,052	62.6	146,953	106,952	136,615	151,592
	6 mos.	309	2,788,498	18,135	2,838,966	243,938	627,613	94,040	493,109	77,481	1,536,181	54.1	1,302,785	1,062,717	1,229,109	745,340
Colorado & Southern	June	1,029	410,169	27,970	480,449	125,864	99,248	12,443	159,154	31,304	428,603	89.2	51,846	—5,183	—16,806	—36,814
	6 mos.	1,029	2,070,220	124,772	2,458,662	444,445	537,001	68,407	970,628	189,989	2,212,439	90.0	246,223	—92,882	—182,837	—259,068
Ft. Worth & Denver City	June	804	515,190	36,938	612,548	45,972	71,690	17,082	158,449	30,644	325,930	53.2	286,618	255,157	224,286	132,231
	6 mos.	804	2,176,134	184,613	2,699,272	192,365	410,828	94,786	828,786	187,866	1,724,028	63.9	975,244	793,838	624,413	441,998
Columbus & Greenville	June	167	43,775	5,170	54,528	13,158	10,939	4,196	27,098	8,698	64,079	117.5	—9,551	—12,195	—9,243	16,148
	6 mos.	167	341,790	30,365	403,789	82,584	64,949	21,119	178,720	52,976	400,338	99.1	3,451	—12,740	—7,196	15,115
Delaware & Hudson	June	848	1,723,402	79,799	1,928,343	283,946	509,101	48,331	720,244	133,892	1,699,643	88.1	228,700	158,270	165,531	92,382
	6 mos.	848	11,258,067	510,781	12,381,060	1,676,158	3,164,404	282,620	4,727,298	803,112	10,679,697	86.3	1,701,363	1,279,171	1,369,576	—684,926
Delaware, Lackawanna & Western	June	992	2,864,993	591,288	3,953,990	391,640	747,133	113,549	1,588,046	152,900	3,002,458	75.9	951,532	600,567	570,535	672,714
	6 mos.	993	17,289,576	3,225,179	23,291,371	1,724,544	4,599,796	642,549	10,044,672	917,074	18,067,902	77.6	5,223,469	3,117,912	2,973,272	867,517
Denver & Rio Grande Western	June	2,558	1,185,643	78,002	1,351,713	176,476	361,774	48,548	444,782	87,551	1,125,796	83.3	225,917	75,251	55,530	196,530
	6 mos.	2,483	7,219,233	352,603	8,071,097	909,181	2,019,819	267,435	2,649,039	463,995	6,333,277	78.5	1,737,820	835,703	832,104	581,848
Denver & Salt Lake	June	232	82,458	3,824	95,213	11,529	18,616	1,179	21,492	10,258	63,074	66.2	32,139	19,139	40,333	45,341
	6 mos.	232	487,367	19,928	564,557	66,088	119,879	9,070	132,387	65,242	392,666	69.6	171,891	88,853	122,005	186,180
Detroit & Mackinac	June	242	34,186	2,557	44,782	13,120	8,330	900	19,944	3,329	45,599	101.8	—817	—3,711	—3,904	5,444
	6 mos.	242	227,693	16,008	277,463	57,918	44,679	5,191	124,319	20,705	252,770	91.1	24,693	36,449	28,380	—5,496
Detroit & Toledo Shore Line	June	50	185,481	...	187,136	24,104	15,125	7,205	52,314	6,346	105,043	56.1	82,093	67,960	33,804	31,040
	6 mos.	50	1,679,297	...	1,689,983	125,436	130,426	40,219	403,811	38,712	738,538	43.7	951,445	802,414	505,990	259,432
Detroit, Toledo & Ironton	June	472	443,062	250	460,753	46,900	73,824	9,848	113,017	17,667	257,743	55.9	203,010	157,285	134,049	87,274
	6 mos.	472	3,297,948	1,594	3,401,928	283,570	433,892	59,559	722,019	102,825	1,580,974	46.5	1,820,954	1,476,857	1,318,743	397,200
Duluth Missabe & Northern	June	563	1,437,981	1,821	1,649,494	164,015	195,941	4,039	248,506	34,431	646,892	39.2	1,002,602	905,864	908,830	253,467
	6 mos.	563	2,851,538	16,564	3,326,097	764,202	1,340,072	19,144	973,027	229,557	3,325,950	100.0	147	—417,395	—412,805	—695,905
Duluth, Winnipeg & Pacific	June	178	61,384	2,946	67,062	24,554	16,708	1,953	31,908	4,977	80,062	119.4	—13,000	—16,953	—10,743	13,737
	6 mos.	178	402,759	12,566	430,725	103,278	106,501	11,266	203,183	31,122	455,316	105.7	—24,591	—47,357	—1,272	—29,402
Elgin, Joliet & Eastern	June	446	963,490	1	1,111,831	108,553	251,586	12,290	369,901	38,998	781,295	70.3	330,536	251,063	209,861	243,353
	6 mos.	446	5,193,045	6	5,767,293	546,427	1,365,851	73,950	2,086,576	251,042	4,323,623	75.0	1,443,670	960,188	699,660	45,594
Erie Railroad	June	2,315	5,484,595	469,672	6,558,630	707,780	1,359,410	167,471	2,231,872	279,903	4,749,239	72.4	1,809,391	1,474,229	1,130,197	1,552,980
	6 mos.	2,315	33,077,398	2,493,679	38,557,115	3,358,041	7,667,452	950,415	13,483,485	1,670,637	27,180,797	70.5	11,376,318	9,364,977	7,480,314	4,691,005
New Jersey & New York	June	45	14,042	52,085	68,408	8,381	23,075	1,132	45,158	3,284	81,030	118.4	—12,622	—16,773	—32,641	—24,506
	6 mos.	45	103,306	325,671	441,145	45,031	145,650	7,435	304,759	21,549	524,424	118.9	—83,279	—108,206	—206,808	—158,662
N. Y., Susquehanna & Western	June	215	247,721	27,156	292,839	35,258	63,939	4,151	115,754	12,435	231,537	79.1	61,302	37,154	16,966	14,559
	6 mos.	215	1,692,948	158,190	1,949,387	173,589	355,903	25,903	755,039	71,412	1,381,845	70.9	567,542	423,937	308,903	97,502
Florida East Coast	June	812	218,295	63,991	330,625	110,047	130,170	19,140	160,175	35,719	460,374	139.2	—129,749	—205,027	—256,773	—213,407
	6 mos.	831	3,162,789	1,241,564	5,020,387	674,357	793,397	122,988	1,369,107	223,587	3,237,343	64.5	1,783,044	1,330,879	997,827	845,456
Fort Smith & Western	June	249	46,763	1,051	51,172	13,845	8,536	5,072	16,638	3,975	48,213	94.2	2,959	1,756	—3,530	—3,679
	6 mos.	249	285,080	6,088	314,678	84,381	59,215	30,501	109,668	23,885	302,619	96.2	12,059	2,839	—24,824	—24,529
Georgia R. R.	June	329	203,605	16,627	239,799	29,565	53,224	15,994	110,467	12,804	222,542	92.8	17,257	11,982	17,608	41,886
	6 mos.	329	1,346,990	77,670	1,565,461	164,634	351,077	97,548	657,780	80,249	1,353,299	86.4	212,162	180,406	215,523	234,613
Georgia & Florida	June	465	88,043	2,543	95,590	21,024	18,493	7,405	37,439	5,441	89,838	94.0	5,752	748	—3,770	6,850
	6 mos.	465	509,512	12,280	553,104	129,384	105,734	45,389	210,130	33,083	524,470	94.8	28,634	—1,828	—19,112	—67,596
Grand Trunk Western	June	1,006	1,409,668	69,856	1,608,980	298,173	300,195	33,916	593,803	79,082	1,308,003	81.3	300,977	231,108	119,419	87,562
	6 mos.	1,007	8,417,287	336,620	9,445,823	1,186,794	1,908,640	195,660	3,790,653	474,174	7,577,121	80.2	1,868,702	1,408,846	686,380	—461,639
Canadian Nat'l Lines in New Eng.	June	172	68,635	5,537	82,438	33,752	14,609	2,820	44,847	8,466	104,799	127.1	—22,361	—35,080	—66,717	—68,186
	6 mos.	172	434,413	29,622	513,326	130,756	105,079	16,283	321,232	54,646	630,876	122.9	—117,550	—185,413	—396,605	—416,149
Great Northern	June	8,360	5,345,493	499,042	6,503,543	1,417,938	1,074,622	164,658	1,880,304	181,879	4,785,315	73.6	1,718,228	1,207,294	1,102,137	1,601,504
	6 mos.	8,361	25,147,795	1,837,133	29,801,671	4,067,877	5,790,096	1,003,891	10,340,720	1,169,263	22,663,055	76.0	7,138,616	3,888,892	3,175,721	1,456,518
Green Bay & Western	June	233	78,456	954	83,229	22,848	17,276	4,270	37,891	2,587	84,854	101.9	—1,625	—7,173	—11,759	220
	6 mos.	233	500,560	5,341	529,743	111,213	116,116	26,794	238,047	16,288	508,266	95.9	21,477	—11,331	—21,728	9,820
Gulf & Ship Island	June	259	68,080	7,565	85,565	12,284	13,191	2,557	42,762	4,608	75,398	88.1	10,167	—5,723	—15,790	5,555
	6 mos.	261	488,849	40,219	613,105	90,470	91,674	14,342	275,720	28,496	502,043	81.9	111,062	16,830	—46,167	—71,533

Continued on next left-hand page


Maximum Fuel and Water Savings
100 % Efficient
Less than Maximum Fuel and Water Savings
75 % Efficient
Much less than Maximum Fuel and Water Savings
50 % Efficient
Very much less than Maximum Fuel and Water Savings
25 % Efficient
No Savings in Fuel and Water
0 % Efficient

Savings from your Superheater *vary with its condition*

A new superheater gives you very substantial savings in fuel and water. This is 100 per cent superheater efficiency.

An old superheater, neglected at the backshops or makeshift repaired in the roundhouses, may have its efficiency reduced to 75, 50 or even 25 per cent with a corresponding lowering of the savings in fuel and water. Any patch repair work, such as welding on return bends and ball ends, with accompanying restriction of areas through the units, markedly lowers superheater efficiency.

Areas through units frequently are restricted as much as 25 per cent, thereby materially reducing the capacity. Units often are shortened by repairing — cases of shortening of as much as 25 to 30 inches have been observed — which, of course, cuts down the superheating capacity.

When superheater units become unserviceable after many years of severe duty, don't attempt repairs that might lower their efficiency. The Elesco unit remanufacturing service will rebuild them at a price usually half that for new units, but for 100 per cent superheater efficiency and many years of trouble-free service ahead.

WRITE TODAY FOR PARTICULARS

THE SUPERHEATER COMPANY

Representative of AMERICAN THROTTLE COMPANY, INC.

60 East 42nd Street NEW YORK — ELESCO — Peoples Gas Building CHICAGO

A-904

Canada: The Superheater Company, Limited, Montreal

Superheaters • Feed Water Heaters • Exhaust Steam Injectors • Superheated Steam Pyrometers • American Throttles

Revenues and Expenses of Railways

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1934—CONTINUED

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures	Maintenance of Equipment	Traffic	Transportation	General	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income	Net ry. operating income, 1933
Gulf, Mobile & Northern	June	961	$418,663	$18,786	$459,031	$60,947	$62,061	$36,578	$138,782	$23,058	$321,626	70.07	$137,405	$106,405	$55,133	$94,937
	6 mos.	961	2,461,443	101,346	2,686,509	336,316	378,936	206,891	817,612	140,296	1,880,564	70.00	805,945	619,867	307,489	276,524
Illinois Central	June	5,010	5,226,560	734,805	6,517,945	655,426	1,395,599	196,884	2,427,582	324,280	5,030,322	77.2	1,487,623	1,066,648	832,326	1,929,452
	6 mos.	5,011	31,130,804	3,780,489	38,619,906	3,098,803	7,842,268	1,035,518	14,584,187	1,925,464	28,679,295	74.3	9,940,611	7,331,398	6,190,936	6,268,926
Yazoo & Mississippi Valley	June	1,636	880,975	68,692	1,009,021	87,074	166,204	27,434	378,791	51,555	711,658	70.5	297,363	196,186	117,820	282,334
	6 mos.	1,643	4,778,166	332,249	5,561,692	420,549	870,969	147,261	2,368,356	300,576	4,110,756	73.9	1,450,936	811,665	257,962	376,347
Illinois Central System	June	6,647	6,107,535	803,497	7,526,966	742,500	1,561,803	224,318	2,806,373	375,835	5,741,980	76.3	1,784,986	1,260,920	959,907	2,221,305
	6 mos.	6,654	35,908,970	4,112,738	44,181,598	3,519,352	8,713,237	1,182,779	16,952,543	2,226,040	32,790,051	74.2	11,391,547	8,131,326	6,507,477	6,701,407
Illinois Terminal	June	525	331,595	53,342	418,263	53,549	56,087	14,839	136,904	16,252	278,996	66.70	139,267	112,932	101,757	84,793
	6 mos.	525	1,929,533	340,028	2,434,912	287,197	356,908	87,739	860,553	95,604	1,692,519	69.51	742,393	588,077	474,195	322,418
Kansas City Southern System	June	882	719,356	18,062	830,712	83,082	134,192	48,537	254,207	71,022	592,190	71.3	238,522	178,230	129,053	158,480
	6 mos.	882	4,166,625	92,542	4,830,060	460,919	805,822	283,217	1,551,259	416,010	3,524,024	73.0	1,306,036	927,247	681,621	507,371
Kansas, Oklahoma & Gulf	June	326	156,402	246	159,331	21,756	15,746	7,480	35,975	8,063	76,492	48.0	82,839	70,065	51,306	50,915
	6 mos.	326	925,058	2,214	944,765	98,307	80,865	43,790	219,315	48,882	472,361	50.0	472,404	390,557	290,840	204,999
Lake Superior & Ishpeming	June	160	201,100	88	234,740	30,669	20,148	841	34,468	5,521	91,647	39.0	143,093	124,744	123,204	89,167
	6 mos.	160	477,207	910	543,510	133,289	117,162	3,445	137,733	34,406	426,035	78.4	117,475	33,004	19,975	—61,304
Lehigh & Hudson River	June	96	117,356	164	120,049	16,421	22,348	3,284	38,010	6,771	86,834	72.3	33,215	24,357	12,806	18,673
	6 mos.	96	733,618	1,082	758,667	90,458	132,293	19,847	250,976	38,374	531,948	70.1	226,719	166,116	91,196	72,580
Lehigh & New England	June	227	261,115	452	264,204	36,797	64,485	5,145	96,334	13,840	216,601	82.0	47,603	39,108	46,144	69,881
	6 mos.	227	1,805,071	2,864	1,821,523	202,411	403,514	31,128	595,215	88,123	1,320,277	72.5	501,246	425,134	434,006	280,184
Lehigh Valley	June	1,353	2,805,929	212,966	3,269,565	401,919	651,584	114,655	1,428,275	120,849	2,734,059	83.6	535,506	339,679	162,372	684,823
	6 mos.	1,353	18,433,661	1,169,063	21,078,521	1,542,793	3,628,521	656,486	8,994,601	753,750	15,664,793	74.3	5,413,728	4,242,987	3,291,547	1,021,246
Louisiana & Arkansas	June	608	317,318	9,290	353,165	46,483	58,309	23,086	86,006	19,302	233,538	66.1	119,627	80,224	75,926	66,382
	6 mos.	608	1,898,230	47,685	2,106,757	269,931	348,264	142,420	523,389	111,238	1,396,966	66.3	709,791	521,380	470,522	428,959
Louisiana, Arkansas & Texas	June	255	82,012	326	87,921	20,133	8,101	5,362	25,858	4,148	63,602	72.3	24,319	21,624	8,432	11,744
	6 mos.	255	448,899	1,557	479,477	96,577	54,823	26,415	160,936	25,776	364,527	76.0	114,950	99,943	13,626	—30,934
Louisville & Nashville	June	5,063	4,868,675	448,276	5,717,140	722,234	1,379,086	161,985	2,039,539	298,285	4,621,105	80.8	1,096,035	752,238	670,658	1,052,966
	6 mos.	5,069	30,343,252	2,513,403	35,645,775	4,083,619	7,455,511	996,138	12,222,075	1,678,733	26,627,246	74.7	9,018,529	6,958,559	6,953,101	4,187,622
Maine Central	June	1,056	688,304	96,877	879,658	153,016	138,146	9,975	306,983	38,058	646,184	73.5	233,474	185,652	148,135	233,129
	6 mos.	1,047	4,601,933	457,928	5,560,876	899,379	1,039,034	57,783	2,111,253	220,222	4,327,624	77.8	1,233,252	946,581	631,521	876,035
Midland Valley	June	363	79,236	546	83,998	15,095	14,448	2,192	25,771	6,016	63,166	75.2	20,832	16,314	13,573	37,715
	6 mos.	363	559,312	2,492	584,898	94,901	68,103	14,185	164,329	37,489	375,572	64.2	209,326	174,512	134,002	174,807
Minneapolis & St. Louis	June	1,627	447,794	14,116	500,537	89,895	120,435	22,633	267,693	34,574	534,263	106.7	—33,726	—79,220	—96,856	118,188
	6 mos.	1,627	3,064,134	77,576	3,374,224	437,693	779,465	128,180	1,708,073	197,822	3,246,190	96.2	128,034	—100,360	—219,289	—112,385
Minn., St. Paul & S. S. Marie	June	4,303	1,723,820	107,855	2,010,103	325,543	323,789	59,928	730,763	103,060	1,551,863	77.2	458,240	301,547	167,938	346,292
	6 mos.	4,304	9,320,338	459,645	10,686,101	1,510,889	2,190,640	352,620	4,429,158	635,326	9,147,115	85.6	1,538,986	639,570	—81,811	—600,227
Duluth, South Shore & Atlantic	June	555	216,835	9,578	253,095	22,359	37,426	4,614	77,624	5,537	147,427	58.2	105,668	97,608	80,682	11,549
	6 mos.	558	915,593	54,675	1,064,452	151,487	232,422	26,478	439,663	33,811	882,423	82.9	182,029	109,766	50,471	—140,705
Spokane International	June	163	45,594	1,752	52,641	14,508	5,658	1,719	18,664	4,060	44,593	84.7	8,048	4,074	1,264	—2,442
	6 mos.	163	203,366	8,610	240,197	59,765	29,613	10,144	112,756	24,577	236,839	98.6	3,358	—20,596	—34,186	—87,012
Mississippi Central	June	150	42,199	1,629	45,816	8,890	11,287	6,905	13,876	5,789	46,747	102.0	—931	—4,025	—5,945	6,673
	6 mos.	150	301,056	8,124	321,203	53,480	61,724	41,239	96,853	31,922	285,215	88.8	35,988	18,835	2,785	—30,508
Missouri & North Arkansas	June	364	73,339	1,314	82,286	14,603	11,217	3,432	25,222	3,973	58,447	71.0	23,839	21,264	11,187	—18,004
	6 mos.	364	443,323	7,325	494,201	124,099	65,029	19,966	169,839	22,595	401,278	81.2	92,923	82,165	24,038	—52,710
Missouri-Illinois	June	213	81,203	557	83,487	18,759	10,213	2,595	26,205	5,504	63,238	75.7	20,249	14,564	7,393	4,898
	6 mos.	213	453,682	2,419	466,619	89,835	59,569	15,202	150,269	33,055	347,883	74.6	118,736	87,320	49,804	—31,868
Missouri-Kansas-Texas Lines	June	3,293	1,967,326	182,714	2,386,775	256,294	343,396	120,077	776,285	128,121	1,641,720	68.8	745,055	568,743	379,327	328,888
	6 mos.	3,293	10,793,213	917,046	13,089,570	1,656,816	2,268,544	656,440	4,629,989	816,572	10,118,789	77.3	2,970,781	1,920,934	808,265	—55,113
Missouri Pacific	June	7,357	5,276,308	328,690	6,161,261	935,313	1,322,204	205,795	2,045,472	247,790	4,777,674	77.5	1,383,587	1,033,929	619,249	1,134,875
	6 mos.	7,360	30,905,638	1,790,546	36,066,484	4,734,195	7,516,601	1,283,001	12,591,660	1,502,824	27,723,455	76.9	8,343,029	6,338,503	3,891,970	2,450,757
Gulf Coast Lines	June	1,763	541,914	33,379	631,087	110,439	146,404	38,579	221,939	44,166	561,900	89.04	69,187	20,961	36,158	103,374
	6 mos.	1,764	5,003,884	190,040	5,534,104	768,703	875,204	250,269	1,601,226	270,432	3,758,387	67.91	1,775,717	1,484,517	855,320	222,677
International-Great Northern	June	1,159	886,715	60,213	1,053,048	145,278	170,486	27,096	363,921	43,293	757,930	71.97	295,118	259,651	149,935	255,791
	6 mos.	1,159	5,446,586	291,647	6,304,868	775,654	1,009,871	168,152	2,265,679	254,769	4,525,221	71.77	1,779,647	1,567,937	809,588	970,411
San Antonio, Uvalde & Gulf	June	316	58,638	2,361	67,631	19,676	8,768	3,864	20,600	4,255	57,155	84.5	10,476	6,728	—11,182	—23,658
	6 mos.	316	531,181	16,400	588,522	105,669	56,491	24,921	180,005	25,354	392,311	66.7	196,211	173,613	51,193	—97,005
Mobile & Ohio	June	1,201	649,645	26,731	715,166	112,031	172,873	41,370	260,317	35,852	622,445	87.0	92,721	59,693	—7,399	69,363
	6 mos.	1,201	4,018,335	130,390	4,395,744	608,865	1,065,849	237,954	1,586,809	213,163	3,712,662	84.5	683,082	478,119	47,388	41,687
Monongahela	June	177	307,789	782	310,433	35,098	28,573	425	56,958	3,941	124,995	40.3	185,438	159,270	84,815	126,539
	6 mos.	177	2,015,811	5,280	2,035,287	204,235	175,184	2,162	408,449	21,601	810,521	39.8	1,224,766	1,096,596	630,253	445,675

Continued on next left-hand page

RAILROAD DIESELS FOR RAILROAD MEN

Where sufficient hours of service per day can be obtained, the savings in direct operating expenses alone will warrant the purchase of Diesel switching locomotives.

However, these direct operating savings become minor incidentals when one can eliminate such expensive facilities as coal docks, ashpits, and water towers, which in many cases are being maintained at outlying terminals and in very congested territories simply for the adequate servicing of steam switching locomotives.

This advertisement (No. 9 of a series) presents another of the many factors which, all combined, make the ALCO Diesel an outstanding purchase.

AMERICAN LOCOMOTIVE COMPANY

ALCO DIESEL

30 CHURCH STREET · NEW YORK · N·Y·

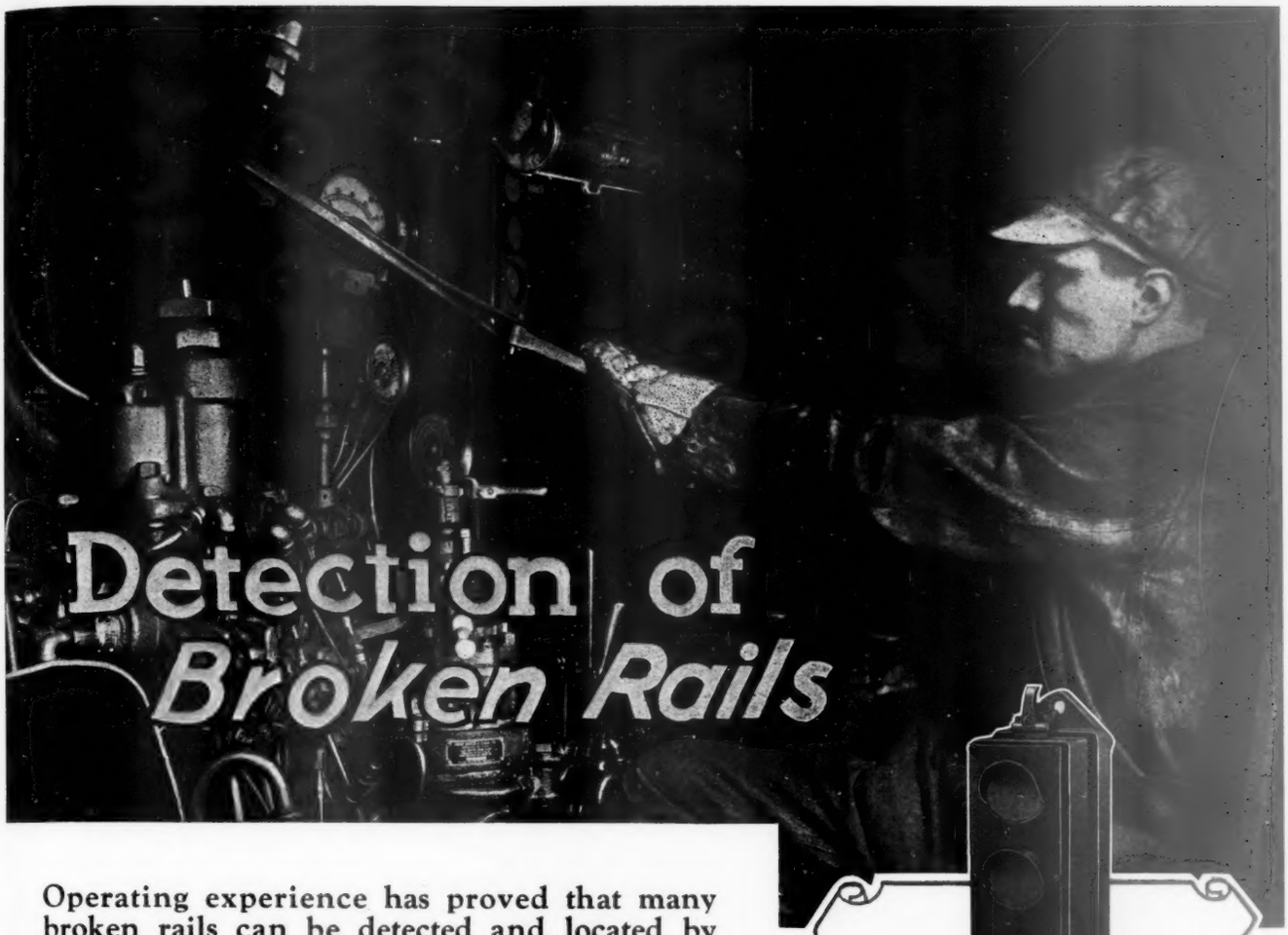
Revenues and Expenses of Railways

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1934—CONTINUED

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of: Way and structures	Equipment	Traffic	Transportation	General	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income	Net ry. operating income, 1933
Montour	June	57	$152,060	.....	$152,239	$20,204	$41,777	$1,001	$28,971	$6,614	$98,567	64.7	$53,672	$33,295	$54,193	$122,793
	6 mos.	57	886,201	$3	888,855	77,976	295,105	6,181	193,896	34,134	607,292	68.3	281,563	224,307	324,475	395,523
Nashville, Chattanooga & St. Louis	June	1,203	789,435	67,429	955,309	139,293	218,949	52,333	393,282	52,924	861,444	90.2	93,865	61,827	40,594	141,394
	6 mos.	1,203	5,476,026	417,389	6,598,410	859,982	1,461,351	328,857	2,486,044	335,632	5,498,089	83.3	1,100,321	879,617	707,803	643,979
Nevada Northern	June	165	24,857	425	29,080	8,312	3,091	509	6,494	2,812	21,218	73.0	7,862	1,158	5,033	—2,082
	6 mos.	165	129,034	6,034	158,571	50,621	16,248	4,074	40,936	19,212	131,091	82.6	27,480	—11,685	12,390	—39,184
New York Central	June	11,411	16,923,014	5,308,439	25,409,874	2,517,755	5,109,540	518,989	8,861,926	1,043,323	18,376,361	72.3	7,033,513	4,671,779	3,129,717	4,436,056
	6 mos.	11,411	106,941,812	26,287,272	151,520,643	14,000,495	31,251,110	3,055,849	55,210,014	6,118,937	111,577,853	73.6	39,942,790	25,673,704	17,167,684	12,787,422
Pittsburgh & Lake Erie	June	233	1,553,503	45,843	1,655,690	138,206	473,273	24,074	456,025	68,428	1,167,545	70.5	488,145	383,123	529,200	438,917
	6 mos.	233	7,472,296	285,643	8,023,049	587,864	2,585,574	147,109	2,661,935	392,307	6,409,054	79.9	1,613,995	1,052,553	1,920,489	1,009,389
New York, Chicago & St. Lous	June	1,691	2,682,876	84,749	2,869,137	355,660	446,583	103,447	954,902	119,204	1,979,680	69.0	889,457	760,036	458,631	766,929
	6 mos.	1,691	16,286,878	353,795	17,231,793	1,634,235	2,535,564	594,177	5,808,037	731,486	11,287,128	65.5	5,944,665	5,061,829	3,372,447	2,096,694
N. Y., New Haven & Hartford	June	2,067	3,297,177	1,879,430	5,876,552	739,584	997,151	85,655	2,192,104	226,965	4,361,321	74.2	1,515,231	1,135,080	634,889	1,052,186
	6 mos.	2,067	20,784,944	10,778,592	35,791,554	4,071,518	6,278,120	427,759	13,723,555	1,366,601	26,670,062	74.5	9,121,492	6,927,579	3,704,274	2,796,857
New York Connecting	June	20	206,048	.....	220,304	11,777	7,594	.....	27,887	925	48,183	21.9	172,121	138,921	101,375	141,681
	6 mos.	20	1,343,710	.....	1,422,459	60,924	44,452	.....	170,688	5,921	281,985	19.8	1,140,474	939,744	706,752	731,099
New York, Ontario & Western	June	568	608,978	37,702	722,111	87,696	143,514	12,517	271,482	23,560	540,873	74.9	181,238	136,226	88,001	138,083
	6 mos.	568	4,307,815	89,234	4,840,577	472,058	886,061	71,464	2,008,769	148,505	3,612,209	74.6	1,228,368	954,689	664,855	809,955
Norfolk & Western	June	2,185	6,010,847	158,724	6,361,099	641,565	1,676,061	108,910	1,358,746	191,117	3,989,335	62.7	2,371,764	1,678,507	1,913,250	2,108,548
	6 mos.	2,185	34,911,601	822,747	36,897,117	3,679,789	8,286,403	671,489	8,231,347	1,152,693	22,097,509	59.9	14,799,608	10,636,899	11,595,210	8,501,492
Norfolk Southern	June	932	613,342	10,176	638,072	68,833	49,192	20,452	161,627	23,137	323,241	50.7	314,831	286,922	240,627	209,272
	6 mos.	932	2,318,710	52,473	2,481,605	396,980	301,909	111,026	836,884	133,272	1,780,071	71.7	701,534	542,422	360,115	—18,069
Northern Pacific	June	6,745	3,451,506	396,291	4,263,933	564,728	887,402	160,319	1,569,585	259,301	3,506,726	82.2	757,207	272,723	509,463	1,039,079
	6 mos.	6,745	19,007,619	1,494,995	22,735,256	2,661,778	5,028,040	904,935	9,034,566	1,534,961	19,487,981	85.7	3,247,275	362,111	2,102,163	—722,894
Northwestern Pacific	June	386	192,522	90,362	316,457	46,255	49,255	4,368	143,068	15,537	258,209	81.6	58,248	41,405	29,198	4,594
	6 mos.	385	819,701	455,272	1,460,193	227,453	263,553	25,391	787,351	81,681	1,384,374	94.8	75,819	—25,656	—83,992	—322,850
Oklahoma City-Ada-Atoka	June	132	31,586	279	33,528	5,328	2,086	639	9,842	1,422	19,257	57.4	14,271	10,291	3,498	—378
	6 mos.	132	162,745	1,848	174,885	29,239	8,230	3,956	60,983	9,273	111,017	63.5	63,868	45,795	5,319	—3,254
Pennsylvania Railroad	June	10,511	23,214,889	4,967,704	31,348,280	3,046,878	5,951,600	586,866	10,462,258	1,401,917	21,795,046	69.5	9,553,234	7,261,661	6,276,127	7,738,526
	6 mos.	10,511	130,255,743	28,710,025	176,377,459	16,197,509	35,374,170	3,295,995	62,465,213	7,994,442	127,394,240	72.2	48,983,219	36,711,579	31,715,058	25,646,328
Long Island	June	400	429,558	1,667,096	2,205,564	186,326	336,401	20,360	908,572	60,365	1,511,821	68.5	693,743	412,603	231,903	452,420
	6 mos.	400	2,976,371	8,211,391	11,773,831	1,125,962	1,899,695	79,148	5,452,267	333,583	8,890,219	75.5	2,883,612	1,808,935	800,274	1,576,658
Pere Marquette	June	2,230	1,910,338	72,146	2,121,032	254,470	461,715	56,545	753,720	91,268	1,621,975	76.5	499,057	405,584	312,998	378,109
	6 mos.	2,241	12,222,981	319,423	13,255,686	1,350,158	2,760,874	346,428	4,876,460	528,591	9,882,168	74.6	3,373,518	2,780,586	2,124,780	443,095
Pittsburg & Shawmut	June	101	34,528	182	35,406	9,479	15,710	1,320	13,284	3,671	43,464	122.7	—8,058	—8,951	—4,180	6,431
	6 mos.	101	348,258	3,099	355,622	58,818	108,920	8,160	107,530	21,550	304,978	85.8	50,644	47,371	76,043	14,071
Pittsburgh & West Virginia	June	138	241,218	.....	252,094	23,601	69,480	14,774	48,200	14,200	179,487	71.2	72,607	54,039	76,914	134,936
	6 mos.	138	1,399,750	.....	1,458,633	120,417	383,752	83,248	289,483	81,245	1,005,170	68.9	453,463	317,982	506,947	356,767
Pittsburg, Shawmut & Northern	June	195	61,059	140	62,898	28,238	17,855	1,317	24,460	5,991	77,861	123.8	—14,963	—17,511	—22,650	—1,750
	6 mos.	195	502,010	1,057	522,848	114,008	126,851	7,755	180,073	37,485	466,172	89.1	56,676	42,898	10,020	5,739
Reading	June	1,461	3,735,701	235,878	4,203,823	359,462	926,513	71,670	1,558,466	188,883	3,122,674	74.3	1,081,149	832,752	881,908	1,337,705
	6 mos.	1,461	25,763,168	1,505,786	28,606,338	1,941,576	5,307,724	430,442	10,236,272	1,143,698	19,162,418	67.0	9,443,920	7,309,387	7,374,698	5,393,354
Penna.-Reading Seashore Lines	June	412	191,740	250,761	477,435	43,722	77,855	11,393	303,470	27,232	461,444	96.7	15,991	—67,147	—173,210	—32,153
	6 mos.	412	1,390,532	897,803	2,434,516	271,015	409,859	46,894	1,765,463	152,096	2,639,076	108.4	—204,560	—628,637	—1,186,556	—426,173
Richmond, Fredericksburg & Potomac	June	117	355,534	100,755	551,827	57,676	106,995	7,492	201,279	27,495	407,110	73.8	144,717	114,154	73,033	73,520
	6 mos.	117	1,819,695	858,015	3,425,044	296,848	717,928	48,789	1,300,032	173,173	2,604,996	76.1	820,048	639,263	363,007	388,113
Rutland	June	413	198,666	22,975	280,050	48,554	52,203	11,011	127,164	14,319	253,274	90.4	26,776	6,766	8,368	40,048
	6 mos.	413	1,115,083	188,366	1,635,803	264,517	350,009	62,160	783,243	81,103	1,540,431	94.2	95,372	—23,059	—6,233	82,956
St. Louis-San Francisco	June	5,144	3,087,210	212,819	3,585,848	615,356	818,692	95,535	1,168,143	148,995	2,851,308	79.5	734,540	508,102	480,817	679,566
	6 mos.	5,191	17,065,096	1,124,540	19,936,805	3,189,887	4,583,396	570,058	7,014,899	871,972	16,252,185	81.5	3,684,620	2,074,574	1,870,391	1,127,330
Ft. Worth & Rio Grande	June	233	32,750	1,226	40,043	13,232	9,274	2,700	20,685	3,909	49,800	124.4	—9,757	—13,471	—18,332	—30,081
	6 mos.	233	162,302	6,624	208,000	87,340	56,141	13,949	124,675	22,033	304,112	146.2	—96,112	—118,196	—149,130	—203,680
St. Louis, San Francisco & Texas	June	261	77,671	598	81,585	31,632	14,767	4,101	32,799	7,287	90,576	111.0	—8,991	—13,161	—38,461	—21,639
	6 mos.	261	439,878	3,287	462,598	168,369	89,165	27,388	197,132	44,516	525,367	113.6	—62,769	—86,876	—241,839	—221,251
St. Louis Southwestern Lines	June	1,810	1,237,530	18,797	1,311,715	112,970	146,192	64,453	401,847	65,925	797,587	60.8	514,128	442,748	274,568	310,470
	6 mos.	1,847	6,808,203	95,130	7,243,747	734,730	1,001,583	406,280	2,371,234	353,662	4,902,607	67.7	2,341,140	1,911,072	1,101,049	684,259
San Diego & Arizona Eastern	June	155	40,068	3,773	44,499	11,215	8,382	1,583	14,499	4,072	40,289	90.5	4,210	2,592	2,810	—975
	6 mos.	155	213,981	30,611	250,721	56,546	51,991	9,811	97,089	24,708	243,572	97.1	7,149	—2,750	3,197	—18,519
Seaboard Air Line	June	4,308	1,905,180	230,050	2,394,939	478,545	543,516	129,117	947,348	128,943	2,245,622	93.8	149,317	—8,414	—26,238	126,782
	6 mos.	4,309	14,967,963	1,726,113	18,715,126	2,997,832	3,616,460	789,894	6,306,646	776,512	14,694,059	78.5	4,021,067	2,655,076	1,834,374	1,478,350

Continued on next left-hand page

NEW



Detection of Broken Rails

Operating experience has proved that many broken rails can be detected and located by "Union" Coded Continuous Cab Signals. And a high percentage of such broken rails would have no affect upon the indication of wayside signals.

Detection of broken rails is but one of the many operating advantages of "Union" Coded Continuous Cab Signals. Shall we tell you about the others?

10 GOOD REASONS—

—Why "Union" Coded Continuous Cab Signals are effective in improving railway service:

1. **Increase safety of train operation.**
2. **Expedite traffic.**
3. **Signal indications are continuously visible irrespective of fog, other weather conditions, curves or physical obstructions.**
4. **Indicate *instantly* any changed condition on track ahead.**
5. **Permit trains to increase speed *at any point* where a less restrictive indication is received.**
6. **Determine location of broken rails.**
7. **Supplemented by audible indication.**
8. **Cab Signal duplicated on fireman's side.**
9. **Prevent misreading of wayside signals.**
10. **Effect operating economies.**

1881 **Union Switch & Signal Co.** 1934

SWISSVALE, PA.

NEW YORK MONTREAL CHICAGO ST. LOUIS SAN FRANCISCO

Revenues and Expenses of Railways

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1934—CONTINUED

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures	Maintenance of Equipment	Traffic	Transportation	General	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income	Net ry. operating income, 1933
Southern Ry	June	6,644	$4,695,886	$715,531	$6,007,654	$824,905	$1,186,163	$143,478	$2,270,724	$247,834	$4,713,002	78.4	$1,294,652	$832,672	$661,882	$1,731,395
	6 mos.	6,644	32,307,089	3,828,274	39,742,393	5,120,898	7,196,963	848,559	14,220,930	1,439,268	29,059,383	73.1	10,683,010	7,949,940	6,762,090	6,269,078
Alabama Great Southern	June	315	351,880	49,319	432,688	69,771	96,862	10,398	131,377	13,382	324,521	75.0	108,167	88,102	70,152	114,506
	6 mos.	315	2,006,365	240,143	2,448,175	433,125	526,226	61,304	803,905	85,969	1,924,156	78.6	524,019	371,059	348,657	138,455
Cinn., New Orleans & Texas Pac.	June	336	880,565	65,092	1,007,809	124,157	188,223	22,112	260,177	36,149	635,042	63.0	372,767	304,117	259,745	361,993
	6 mos.	336	5,587,451	385,674	6,343,486	751,905	1,103,799	136,787	1,611,777	210,967	3,841,985	60.6	2,501,501	2,067,750	1,804,522	1,488,794
Georgia Southern & Florida	June	397	103,452	21,087	141,064	27,657	34,317	2,135	74,089	2,405	142,409	101.0	—1,345	—14,538	—12,349	—10,763
	6 mos.	397	694,146	162,249	973,981	170,029	224,532	10,338	425,285	13,937	857,224	88.0	116,757	39,011	69,380	16,724
New Orleans & Northeastern	June	204	141,104	19,223	174,442	27,508	31,003	5,364	63,146	8,539	137,088	78.6	37,354	14,329	564	—8,178
	6 mos.	204	915,919	106,259	1,105,865	155,941	208,612	32,362	387,093	51,716	844,093	76.3	261,772	124,891	33,826	—227,227
Northern Alabama	June	99	37,862	1,623	41,023	10,585	1,367	1,012	15,782	1,610	30,356	74.0	10,667	7,520	—2,322	2,515
	6 mos.	99	256,024	9,209	275,635	66,384	8,758	6,614	90,540	9,715	181,159	65.7	94,476	75,580	16,200	—20,719
Southern Pacific	June	8,798	8,751,376	1,494,212	11,190,250	942,389	1,574,192	300,385	3,475,235	533,537	7,005,771	62.6	4,184,479	3,356,017	2,807,190	1,631,109
	6 mos.	8,867	40,686,888	7,579,992	53,480,610	5,710,731	9,265,876	1,619,294	18,529,943	3,130,781	39,251,000	73.4	14,229,610	9,229,927	7,058,813	599,841
So. Pac. Steamship Lines	June	....	348,902	11,972	372,988	15,152	103,371	16,622	277,647	23,204	435,996	116.89	—63,008	—63,601	—62,950	18,637
	6 mos.	....	2,016,789	69,246	2,160,611	93,927	672,560	95,935	1,560,848	120,508	2,543,778	117.73	—383,167	—387,273	—384,908	—377,004
Texas & New Orleans	June	4,476	2,174,636	223,681	2,717,573	445,884	652,508	111,309	910,398	194,899	2,325,658	85.6	391,915	166,244	—58,345	58,544
	6 mos.	4,477	12,470,536	1,177,327	15,529,622	2,377,813	3,590,225	668,446	5,282,792	1,199,298	13,185,219	84.9	2,344,403	991,818	—257,429	—706,945
Spokane, Portland & Seattle	June	552	468,819	61,635	571,535	53,091	65,989	5,919	144,506	13,568	285,044	49.9	286,491	227,380	196,605	141,209
	6 mos.	552	2,273,145	211,818	2,692,886	221,112	328,530	33,448	806,593	84,101	1,484,091	55.1	1,208,795	861,021	717,021	143,601
Tennessee Central	June	287	133,104	6,125	149,498	28,622	22,083	5,453	53,146	10,282	119,471	79.9	30,027	28,904	16,543	16,824
	6 mos.	287	957,349	29,134	1,045,597	164,570	153,239	31,095	352,082	62,512	762,392	72.9	283,205	258,561	173,335	93,924
Texas & Pacific	June	1,950	1,515,715	166,907	1,892,401	179,872	318,221	59,771	523,267	106,715	1,203,929	63.6	688,472	566,460	439,242	460,474
	6 mos.	1,950	8,561,520	904,885	10,717,797	1,073,359	1,860,620	381,801	3,142,247	653,858	7,202,499	67.2	3,515,298	2,873,317	2,191,314	1,484,392
Texas Mexican	June	162	51,846	79	58,853	14,769	12,743	3,079	26,996	7,182	64,769	110.0	—5,916	—10,166	—11,977	—20,576
	6 mos.	162	410,256	2,355	450,357	59,408	74,379	17,762	150,643	39,542	340,891	75.7	109,466	83,342	56,370	—65,390
Toledo, Peoria & Western	June	239	142,553	33	144,597	25,960	13,483	14,964	42,517	17,354	114,278	79.0	30,319	26,569	13,104	17,322
	6 mos.	239	792,856	109	805,277	209,987	70,129	88,481	242,065	55,921	666,583	82.8	138,694	123,092	43,666	79,013
Union Pacific	June	3,767	4,021,542	563,952	5,142,234	675,273	1,160,101	128,924	1,550,273	256,696	3,858,120	75.0	1,284,114	840,394	645,342	1,614,129
	6 mos.	3,767	25,102,626	2,332,877	30,359,314	2,926,240	7,428,226	704,599	9,218,892	1,575,358	22,248,304	73.3	8,111,010	5,407,178	4,138,437	5,032,569
Oregon-Short Line	June	2,504	1,221,641	123,987	1,480,858	301,836	281,618	33,493	503,846	84,673	1,226,133	82.8	254,725	25,843	—38,943	324,827
	6 mos.	2,504	8,005,703	544,472	9,364,492	1,196,874	1,598,413	184,963	3,012,867	520,437	6,726,635	71.8	2,637,857	1,275,363	840,077	638,636
Oregon-Wash. R. R. & Nav. Co.	June	2,295	836,103	123,899	1,119,018	234,256	184,739	49,462	442,137	81,123	999,478	89.3	119,540	—21,742	—117,972	10,936
	6 mos.	2,295	5,686,887	553,839	7,026,450	1,349,888	1,035,629	284,274	2,588,075	498,493	5,789,826	82.4	1,236,624	424,159	—148,060	—780,957
Los Angeles & Salt Lake	June	1,241	1,190,723	179,631	1,482,630	171,115	181,180	44,780	385,583	53,834	872,444	58.8	610,186	489,515	378,938	180,170
	6 mos.	1,241	6,622,376	703,395	7,944,364	952,388	1,162,330	260,510	2,256,679	327,035	5,128,146	64.6	2,816,218	2,092,775	1,403,387	376,363
St. Joseph & Grand Island	June	258	180,993	1,673	189,639	38,900	22,392	2,084	66,954	11,017	142,235	75.0	47,404	34,985	11,308	51,235
	6 mos.	258	1,314,685	10,053	1,365,950	174,810	139,616	12,807	397,328	67,197	795,760	58.3	570,190	474,158	300,831	203,363
Utah	June	111	31,694	.....	31,730	9,111	14,330	520	8,763	4,944	37,668	118.7	—5,938	—11,204	—20,705	—19,698
	6 mos.	111	277,461	.....	278,080	52,433	96,109	3,288	70,910	30,288	253,028	91.0	25,052	—14,533	—77,632	52,355
Virginian	June	619	1,037,488	3,925	1,084,508	116,811	208,031	16,357	202,245	23,776	566,724	52.3	517,784	382,784	441,051	529,569
	6 mos.	619	6,727,332	31,681	7,020,257	608,154	1,279,022	97,510	1,261,296	146,358	3,389,543	48.3	3,630,714	2,770,707	3,141,923	2,642,146
Wabash	June	2,457	2,793,119	185,954	3,221,466	477,082	537,514	134,614	1,194,999	119,322	2,463,805	76.5	757,661	626,558	276,135	511,190
	6 mos.	2,457	17,266,093	943,223	19,493,859	2,279,541	3,159,906	793,056	7,249,824	734,729	14,243,633	73.1	5,250,226	4,457,016	2,366,448	267,666
Ann Arbor	June	293	269,493	3,157	282,683	27,028	45,289	11,012	114,832	10,830	209,253	74.0	73,430	62,963	40,886	27,600
	6 mos.	293	1,583,429	15,298	1,643,969	139,070	292,777	63,746	698,528	61,184	1,255,599	76.4	388,370	302,436	190,196	4,509
Western Maryland	June	890	1,114,326	6,982	1,148,787	179,104	276,038	34,695	283,586	45,297	820,464	71.4	328,323	258,323	281,581	281,867
	6 mos.	891	6,809,771	42,748	7,046,478	910,081	1,582,000	202,821	1,773,743	236,294	4,711,702	66.9	2,334,776	1,884,776	2,099,275	1,602,539
Western Pacific	June	1,213	905,887	34,658	981,256	199,188	163,546	52,515	344,378	42,836	821,906	83.8	159,350	90,467	70,436	57,391
	6 mos.	1,213	4,859,117	113,022	5,232,702	806,492	935,951	308,603	1,907,741	217,418	4,299,194	82.2	933,508	518,432	413,775	—216,260
Wheeling & Lake Erie	June	511	1,084,699	1,307	1,161,825	128,376	347,857	30,029	311,388	28,385	845,389	72.8	316,436	219,301	217,322	214,787
	6 mos.	511	5,722,764	9,235	6,064,319	544,205	1,789,073	169,612	1,748,169	167,447	4,417,413	72.8	1,646,906	1,108,316	1,029,550	541,929
Wichita Falls & Southern	June	203	47,163	29	52,932	8,839	8,021	1,764	12,993	2,910	34,527	65.23	18,405	15,410	12,916	9,903
	6 mos.	203	246,668	270	278,072	56,010	41,130	10,548	78,217	19,200	205,105	73.76	72,967	55,504	36,818	26,124